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ABSTRACT

During the 1978-79 school year, all third grade pupils in California public schools were tested in reading achievement. Tests of reading, written expression, spelling, and mathematics were administered to all sixth and twelfth graders. Various subtests of the Survey of Basic Skills, which was developed specifically for the California Assessment Program, were used. Results generally indicated improving scores for third and sixth graders, as compared to previous years' test results. Twelfth graders' test scores declined in reading, remained the same in spelling, and improved in writing and mathematics. Several other conclusions were made: (1) females scored higher than males in reading, while males scored higher in mathematics: (2) students who speak English fluently, as well as either Chinese or Japanese, scored highest, followed by those who speak English only: (3) scores were directly related to parents' occupational and educational level, but socioeconomic differences decreased: (4) pupil mobility increased and although the less mobile students scored higher than the more mobile students, this difference became smaller: (5) nearly 60% of the seniors had taken four years of English instruction: and (6) greater exposure to English instruction and essay-writing experience was associated with higher writing scores. (Author/GDC)

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Student Achievement in California Schools

1978-79 Annual Report

TM 800450

California Assessment Program

CALIFORNIA STATE DEPARTMENT OF EDUCATION Wilson Riles, Superintendent of Public Instruction Sacramento, 1979

California Assessment Program

Student Achievement in California Schools

1978-79 Annual Report

Prepared Under the Direction of
Alexander I. Law, Chief
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I. Summary of Findings

During the 1978-79 school year, all third grade pupils in California public schools were tested in reading achievement. All pupils in grade six and grade twelve were tested in the basic skills of reading, written expression, spelling, and mathematics.

Grade Three Results

Reading achievement test scores for third grade pupils have been improving steadily since statewide testing in that grade began in 1967. This trend has continued through 1979. A summary of the test results is presented in Table 1. The overall gain in 1978-79 was 0.2 percent correct. These gains reflect pupil performance on the California Assessment Program's Reading Test, which was constructed specifically to assess the students' attainment of proficiency in the broad range of reading programs in California's public schools.

Special equating studies were conducted to determine the relationship of the current performance of California pupils to the 1973 (the latest year for which comparable figures were available) performance of a sample of pupils across the nation. The median score of third grade pupils in California was determined to be at the 58th percentile rank.

Grade Six Results

All students in grade six took the Survey of Basic Skills: Grade 6, another test developed (in 1974-75) specifically for the California Assessment Program. The scores of California sixth grade students improved in all content areas tested: reading, written expression, spelling, and mathematics (see Table 1). The gain was least in spelling (0.4 percent correct). An equal amount of gain (0.5 percent correct) was achieved in the areas of reading, written expression, and mathematics.

An equating study provided a basis for comparing California students with a national sample of students tested in 1973. On the basis of the results of the study, the median sixth grade student in California is now above the national median in all areas. In mathematics the median sixth grader in California moved from the 53rd to the 54th percentile rank in 1978-79. The median student moved from the 51st to the 52nd percentile rank in written expression and remained at the 55th percentile rank in reading.

Grade Twelve Results

All students in grade twelve took the same test that has been administered since 1974-75--the Survey of Basic Skills: Grade 12. Reading performance continued to decline (by 0.1 percent correct), although the decline was less than last year (-0.3) or the year before (-0.5). Spelling did not change from 1977-78, and written expression and math both showed improvement (0.3 and 0.2 percent correct, respectively).

Special equating studies provide a basis for comparing the performance of California twelfth graders with that of national test publishers' norm samples tested in 1962 and 1970. On the basis of the 1962 norms, the median twelfth grade student in California in 1978-79 was at the 41st percentile rank in reading, the 34th percentile rank in written expression, and the 43rd percentile rank in mathematics.

Comparisons with two other tests with 1970 norms placed California twelfth grade students somewhat lower: at the 32nd and 34th percentiles in reading, at the 27th and 28th perceniles in written expression, and at the 41st and 43rd percentiles in mathematics.

The report also includes a brief comparison of the mathematics findings of the California Assessment Program and the recently reported findings of the National Assessment of Educational Progress.

The report presents a summary of grade twelve written expression scores, by the number of years of English study students had completed and the number of reports or essays they had written in the six weeks preceding the testing.

Subgroup Analyses

Statewide test performance was analyzed separately for several different subgroups of pupils. A summary of the main findings is presented below:

1. Girls scored higher than boys in reading, and boys scored higher than girls in mathematics. In reading, the gap between the boys and girls continued to decrease in grades three and six and and remained constant in grade twelve. In mathematics, the girls made considerable progress in closing the gap at grade twelve, while the boys maintained their lead in grade six. Most of these differences are quite small; however, the boys' lead in mathematics in grade twelve is still quite substantial.

2. Substantial score differences were observed among pupils grouped according to level of English language fluency. The highest scoring group of pupils were those considered fluent in English who also spoke Chinese or Japanese. This small group of pupils scored higher than those who spoke English only. The students who spoke limited English and another language scored substantially lower than the other groups. Nearly all groups scored higher in 1978-79 than in 1977-78.

Table 1

Number of Students Tested and Average Percent of Questions Answered Correctly by Grade Level and Content Area for 1975-76, 1976-77, 1977-78, and 1978-79

Grade level and content area	Number tested	Average percent of questions answered correctly						
						Difference		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
Grade 3 -- Reading	306,685	81.4	81.7	82.2	82.4	+0.3	+0.5	+0.2
Grade 6	287,075							
Reading		66.1	65.9	66.3	66.8	-0.2	+0.4	+0.5
Written Expression		62.5	63.6	64.1	64.6	+1.1	+0.5	+0.5
Spelling		63.6	63.6	64.1	64.5	-0-	+0.5	+0.4
Mathematics		57.4	57.7	58.5	59.0	+0.3	+0.8	+0.5
Grade 12	237,297							
Reading		64.1	63.6	63.3	63.2	-0.5	-0.3	-0.1
Written Expression		62.3	61.9	62.1	62.4	-0.4	+0.2	+0.3
Spelling		68.0	67.9	68.4	68.4	-0.1	+0.5	-0-
Mathematics		67.0	66.3	66.3	66.5	-0.7	-0-	+0.2

Within the two categories of "fluent English and another language" and "limited English and another language," those students whose other language was Spanish scored substantially lower than those whose other language was other then Spanish. Further, a greater proportion of students were "coded" in these categories in 1978-79.

3. There was a direct relationship between test scores and parental occupational level. The higher a parent's occupational or educational level, the higher the average student's test scores. Perhaps more significantly, the gap between the average scores of the pupils from the highest economic, or occupational, levels and those from the lower economic levels continued to decrease.

4. Pupil mobility continued to increase from 1977-78 to 1978-79. Although the less mobile pupils continued to score higher than the more mobile pupils, the margin continued to shrink.

5. Nearly 60 percent of the seniors had taken four years of English, and another 35 percent had taken three years. Statewide, over 20 percent of the seniors reported not writing any reports or essays during the six-week period preceding the testing. Written expression scores systematically increased with more years of english study, with number of essays written, and with parent educational level. Furthermore, students from higher educational backgrounds tended to take more English courses and to write more than other students.

The major portion of this report is devoted to an analysis of the specific test findings for each subject area. Example test questions are presented to illustrate the relative strengths and weaknesses of California students. The discussion of results for each content area is based heavily on the comments of recognized authorities who reviewed the findings and pointed out implications for the improvement of California's school programs.

Finally, this year's report also contains a short summary of some important ways the test results are being used to improve local instructional programs, guide statewide school improvement efforts, and inform state-level policymakers.

II. Introduction to the Report

This report contains the complete statewide results of the California Assessment Program, including the following key features:

- Detailed findings. Information is presented not only for the major content areas of reading, written expression, and mathematics but also for a variety of specific skill areas within each major area. This year for the first time, the skill area findings for mathematics have been analyzed and reported separately for boys and girls on the basis of socioeconomic level. Twelfth grade written expression scores are also analyzed and described in the light of two other new factors: (a) number of years of English completed; and (b) frequency of assigned writing assignments.

- National comparisons. Although tests were developed to correspond specifically to the skills and concepts being taught in California schools, special studies have been conducted to show how the performance of California students compares to show how the performance of California students compares with that of recently tested samples of students from throughout the nation.

- Expert opinions. Recognized authorities in each professional field have presented their interpretations of the results for each of the content areas by identifying skill areas of relatively impressive student performance and other skill areas that need attention. Last year's report offered some classroom instructional strategies suggested by the various subject matter committees to overcome these weaknesses. This year's report amplifies those suggestions.

- Comparable results. The tests used in the California Assessment Program have been developed and refined to the extent that they can continue to be used without revision for a period of years. All results in this report are comparable to those of the previous three years.

- Subgroup analyses. With the stability of the tests, it has become possible and appropriate to examine the differences in standing and in rate of progress among various subgroups of pupils. Four years of findings for different groups of pupils are included in this year's report. New features this year include the analysis of sixth and twelfth grade findings, by student mobility rate and socioeconomic level.

- Use of results. Questions are frequently raised about the purposes of the statewide assessment program and the uses of its findings. Statewide testing legislation spells out the audiences for the information and the types of uses expected. A new element has been added to the report this year (see Appendix I) which summarizes and illustrates the range and magnitude of use by school personnel, legislators, state department personnel, university researchers and other members of the public.

Development of the California Assessment Program

The California Assessment Program was first fully implemented in 1974-75. In design, development, and procedures, it is unique in the nation. The assessment program was designed with several criteria in mind: (1) It must be relevant to California schools; (2) It must cover the full range of instructional objectives; (3) It must provide program-diagnostic information at the local and state levels; and (4) It must take only a minimum of testing time. This section describes the process of developing such a program.

Background and Assumptions

The new assessment program had its foundation in two legislative acts: (1) the California School Testing Act of 1969, a revision of a 1961 law which first required an achievement testing program in the public schools; and (2) the Miller-Unruh Basic Reading Act, which originally required reading tests in grades one, two, and three. The testing program was revised by 1972 legislation, and major changes were made in the program as a result of that legislation.

The changes in the statewide testing program were based on the principle that an efficient state testing program has to be limited in scope--that is, limited primarily to the task of furnishing useful information to state-level policy makers and decision makers. It was assumed that the program could not meet all of the many information needs of local school district personnel and that assessment information needed at the classroom level could best be collected by local school personnel.

In spite of this assumption, the program was designed to report as much information as possible to local personnel. Since all students at a grade level in all schools were tested, it was possible to provide very detailed analytical reports for each school to supplement locally obtained information. In fact, the results of a survey of all districts in California showed that most districts have found this unique information very useful in evaluating and revising programs. Board members and other local citizens have relied heavily upon statewide results in making judgments about local needs and accomplishments primarily because of the uniform and comparable nature of the information provided.

Reasons for Revising the Testing Program

Two major problems were addressed through the revision of the statewide testing program:

1. Test relevancy and breadth. The incomplete match between the relatively narrow range of skills measured by any one published standardized test, on the one hand, and the variety of instructional programs in California schools, on the other, made it difficult to assess the skills of California students or the effectiveness of the programs with any degree of assurance of fairness. Furthermore, it was not possible to assess the relative strengths and weaknesses of California students in order to have an indication of how instructional programs should be redirected, since the standardized tests being used yielded only total scores.

2. Testing time. Previous testing instruments required an inordinate amount of pupil time for the testing process--inordinate, at least, in relation to the usefulness of the results. The use of a new testing technique called matrix sampling has now reduced the amount of testing time at certain grade levels from as much as three and one-half hours to 30 minutes. Under this sampling method, all students at a grade level in all schools are tested, but each student takes only a portion of the total test. Results for an individual student cannot be obtained, but quite accurate estimates of the overall performance of groups of students can be computed.

Development of the New Tests

The development of tests related to California goals and objectives followed a rigorous procedure. The major steps are outlined below:

1. Statewide committees of content area experts were formed and charged with the task of translating and delineating the general goals found in state-adopted curriculum frameworks into more specific objectives appropriate for assessment.

2. These specific objectives, or test content specifications, were then reviewed by personnel in all California school districts for completeness and relevance to their instructional programs. The revised specifications served as the basic guidelines for selecting and developing pools of test items. These documents were subsequently printed and distributed to all school districts under the general title Test Content Specifications.

3. These content specifications were sent to major test publishers, who identified those test questions which matched the specifications. These were submitted to the Department of Education for review.

4. From the initially large pools of items, teams of classroom teachers reviewed and selected the items that were most appropriate for California students.

5. These items were then reviewed by linguists and minority group testing experts for any subtle biases against students of different language or cultural backgrounds.

6. The final pools of items, several hundred at each grade level, were then divided into several short tests or forms--from ten to 18 per grade level. All test forms were made equivalent in difficulty and in coverage of major skill areas.

The National Norm Dilemma

Since 1962, the first year of statewide testing in California, all tests adopted for use had been commercially published instruments with "national" norms. The new tests described in this report were constructed specifically for use in California schools. The decision to develop tests rather than use commercial "off-the-shelf" tests with national norms was not made casually. Comparisons to national averages are not only interesting but are also useful as a basis for judging the overall relative effectiveness of California's instructional programs. Furthermore, California law (Education Code sections 60663 and 60640) requires that such information be made available.

A real dilemma, one with both philosophical and technical aspects, faces anyone who would measure the basic skills of California students: to choose a test which has national norms but fails to address all the skills taught in California schools, or to develop a relevant test which does not allow easy and immediate national comparisons. Assessment programs in other states are about equally divided between these two approaches. After 11 years of using tests with national norms but less than satisfactory coverage of the skills being taught in California schools and after observing the difficulties faced by other states in interpreting the results from their own tests without national norms, the course to be followed was obvious: develop a test which fits the instructional programs of most California schools and then find a way to compare those results to national norms.

A plan which could accomplish this (allow one to have one's cake and eat it too) had to overcome two main problems with the national norms associated with published standardized tests.

1. No single test is given to all students in the country. Of necessity, a publisher's norm is, therefore, only an estimate of what the distribution of scores would be like if, in fact, the test had been taken by all students in the United States. For this reason, norms vary from publisher to publisher, sometimes in the extreme. In California's own recent history. the Stanford Reading Test was administered to all second grade pupils in the 1969-70 school year, and the median California pupil scored at the 38th percentile of that publisher's norms. In the following year the Cooperative Primary Reading Test was administered to all second grade pupils. The median California pupil scored at the 50th percentile of that publisher's norms. The different result was clearly a reflection more of the difference in norms than of the difference in reading achievement.

2. A second problem with norms is that they are not updated very often. For instance, the Cooperative Primary Reading Test was normed during the 1965-66 school year. As a result, when those norms are referred to, it must be clearly understood that the comparisons being made are to the publisher's estimate of what scores on that test would have been if administered to all pupils in the country at that time. If reading scores for the nation had dropped continuously since 1965-66, an "average" score for California pupils might, in fact, reflect achievement far above current nationwide averages.

The resulting plan is straightforward and efficient. It involves the equating of the California tests to standardized tests with national norms and updating those comparisons as new norms or new tests become available. The equating process requires that a sample of pupils take both the California test and one of the other tests. The effect of the statistical analyses following the testing is to show how California students would have scored if they had all taken the standardized test. Following recent refinements to the equating procedures, a study now has to be conducted only once, but the annual progress on the California test can be translated into the appropriate national percentile ranks--against the year in which the publisher's test was normed, of course, not against the national performance for that year. The latter would be most useful information, but it is simply not obtainable.

This solution has several advantages: (1) the national comparisons are more timely since they can be updated as new norms become available; (2) the estimates are more stable since they do not depend on the representativeness of a single publisher's sample; and (3) it allows California schools to be assessed with a test which fits the objectives of the instructional program, and simultaneously, with almost no additional testing, allows that performance to be compared to national norms.

Essential Information About the Numbers Used in This Report

The percent correct score. The statistic used in this report to indicate the achievement levels of California pupils is the "average percent correct score." For a given set of test questions, this number is the percentage of correct test responses, with one response being equal to the answer of one student to one question, and the total number of responses being equal to the number of students multiplied by the number of items on the test. For example, if three students took a test with ten questions and if each of the three answered five of the ten questions correctly, the total number of responses would be 30, the total number correct would be 15, and the average percent correct score would be 50. It can also be said that the average student answered 50 percent of the questions correctly; or that, on the average, 50 percent of the questions were answered correctly.

The average percent correct score and the simultaneous presentation of illustrative test questions or exercises are designed to add to the clarity and usefulness of the findings. It should be easier, as a result, to see what California students are able to do. Unfortunately, this method is so new in educational evaluation and assessment that guidelines and rule-of-thumb benchmarks are not available. Each reader will have to evaluate the adequacy of the results. The emphasis is on establishing realistic and necessary levels of actual competence rather than on the traditional comparing of results to a national norm.

How high is high? It will be noted that most of the average percent correct scores hover around the 60s and 70s; however, some are down in the 30s, and some are up in the 90s. Two points must be kept in mind in interpreting these figures:

1. The major reason that the average scores are in the 60s and 70s, rather than the 90s, is that the aims of the instructional programs at each level in California schools go beyond the basic, minimal levels of performance expected of all students. In reading, for example, those skills which are mastered by most students by the end of the third grade are not even tested in the sixth grade. Testing time is too valuable and the scoring and the processing too expensive to justify gathering information which does not add to what is already known about California students.

2. It should be obvious that high scores in particular subskill areas do not necessarily indicate effective programs; or low scores, the opposite. Some tasks are inherently more difficult. In reading, for example, it is not considered outstanding that by the end of grade three, nearly all students can immediately recognize and read certain short words: and it is not at all disappointing that only about 60 percent can answer certain questions requiring a student to recognize cause-and-effect relationships among sentences.

Interpretations of experts. The overall results and especially the differences among various subcontent or skill areas have been reviewed by special advisory committees of highly respected educators in each field. It is hoped that their comments about the adequacy of the findings and their discussion of the implications for shifts in program emphasis will be helpful both to the professional educator and the lay citizen concerned with education in California. Obviously, however, not all readers will agree with the opinions of the specialists. Any discussion or inquiry which is stimulated by these opinions is useful in that it will help to clarify the proper objectives of the schools and foster realistic expectations of them.

III. Reading Achievement for Grades Three, Six, and Twelve

Synopsis of Findings

California's third and sixth grade pupils continued to show improvement in reading achievement from 1977-78 to 1978-79 and continued to score above the national average. Twelfth grade students, scoring below national norms, declined for a third consecutive year. Over the past 12 years, reading achievement test scores in grade three have shown slow but steady improvement. Third grade scores increased 0.2 percent correct from 1977-78 to 1978-79, an increase which translated into a gain of 1 percentile point on national norms. The median third grade pupil now ranks at the 58th percentile, 8 percentile points above the national average.

Sixth grade reading scores also registered an increase (0.5 percent correct) from 1977-78 to 1978-79. The median sixth grade pupil is scoring at the 55th percentile rank--5 points above the national average.

Twelfth grade reading scores declined (0.1 percent correct) from 1977-78 to 1978-79, a decline which translated into a loss of 1 percentile point on national norms. The median twelfth grade student is now scoring at the 41st percentile--9 percentile points below the national average.

Skill Area Strengths and Weaknesses

The members of the Reading Assessment Advisory Committee reviewed the statewide 1978-79 reading results, as they do every year, to check the progress and identify strengths and weaknesses in the reading achievement of California students. While the following presentation of skill area strengths and weaknesses is based upon the committee's judgments, the Department of Education accepts full responsibility for the conclusions in this report.

The members of the committee discerned recurring patterns of strengths and weaknesses in the reading achievement results at each of the grade levels tested (3, 6, and 12). Their judgments for each of these grades are consolidated in Figure 1 for ease in making comparisons across grade levels.

Figure 1

Committee Judgments of Third, Sixth, and Twelfth Grade Reading Results

Area of strength	Area in need of improvement
Comprehending short, simple sentences in isolation: Grade 3 - Example A	Putting the meaning of sentences and sentence parts together through the use of connecting words, such as conjunctions and pronouns: Grade 3 - Examples C and D Grade 6 - Examples K and M Grade 12 - Examples T and U
Identifying explicit details stated within one or two sentences within a paragraph: Grade 3 - Examples B and E Grade 6 - Example L Grade 12 - Example Q	Recognizing word meanings: Grade 6 - Examples H, I, and K Grade 12 - Examples R and S
Recognizing literal main ideas: Grade 3 Grade 6 - Example N Grade 12 - Example W	Drawing inferences: Grade 3 - Examples F and G Grade 6 - Examples O and P Grade 12 - Examples W and X

The members of the Reading Assessment Advisory Committee offered the following broad instructional recommendations for the three grade levels after reviewing the statewide reading results.

Recommendations for Grade Three

The committee recommended that primary students receive increased experience and instructional assistance in the following:

- Comprehending, manipulating, and paraphrasing sentences to increase pupils' understanding of how sentences and sentence parts fit together (with special emphasis on connecting words, such as conjunctions and pronouns)

- Drawing inferences of all kinds from a variety of classroom reading materials including such skills as getting the main idea, sensing cause and effect relationships, making judgments, and applying information to new situations

Recommendations for Grade Six

After reviewing the statewide pattern of strengths and weaknesses within the sixth-grade reading results, members of the Reading Assessment Advisory

Committee recommended that intermediate students receive increased instructional assistance in the following:

- Word study and vocabulary development (including word-forming skills involving the spelling, meaning, and use of words based upon roots, prefixes, and suffixes)
- Location of an idea within one or more sentence structures (including the relationship between an appositive and its referent--see Example D--and the relationship between a pronoun and its referent--see Example E)
- Inferential and critical comprehension (including inferring, interpreting and evaluating information and ideas stated in written material)

Recommendations for Grade Twelve

The advisory committee concluded that the continuing decline in twelfth grade reading scores, especially in contrast to this year's increases in math and written expression, demonstrates the need for direct reading instruction in vocabulary and the comprehension skills in the context of every single subject area.

All members of the committee agreed that English, science, social studies, and math teachers need to work on vocabulary and especially the higher inferential thinking skills within their disciplines.

Because of the continuing decline and uneven performance within the interpretive-critical comprehension skill area, members of the committee concluded that the higher reading and thinking skills are in need of special instructional emphasis.

In addition to the higher inferential comprehension skills, members of the committee suggested the following instructional emphases in response to the observable weaknesses within the twelfth-grade reading achievement results:

- Word-forming skills involving the spelling, meaning, and use of words based on roots, prefixes, and suffixes
- Vocabulary development in all the content areas
- The multiple meanings and connotations of words
- Use of careful word choices to reveal feelings and attitudes and to create special effects

- Use of context for deciphering word meanings
- Understanding the relationships between words within sentences and paragraphs (such as relating a pronoun to its referent and relating a prepositional phrase to the word it modifies)

The committee members recommended wide reading as one very effective method for helping students to increase their vocabulary and improve their comprehension skills. In addition, they recommended the sustained discussion of reading materials as a productive teaching strategy. Such discussions focussing on the details of word, sentence, and paragraph meaning are helpful in the development of both vocabulary and comprehension skills. The committee reiterated that all of the various vocabulary and comprehension skills should be taught within the context of all the content areas at the secondary level.

Reading Results for Grade Three

Test Scope

The Reading Test: Third Grade is the instrument developed specifically to assess reading achievement at the end of the third grade in California's elementary schools. It was designed to assess the students' attainment of a wide variety of objectives discussed broadly in Framework in Reading for the Elementary and Secondary Schools of California (Sacramento: California State Department of Education, 1973) and specified, with the help of the Reading Assessment Advisory Committee, in Test Content Specifications for California State Reading Tests (Sacramento: California State Department of Education, 1975). Both the objectives and the 250 test items that were used to assess them fall into one of six major skill areas: phonetic analysis, structural analysis, vocabulary, literal comprehension, interpretive-critical comprehension, or study-locational skills.

This section contains results for grade three only. No grade two results are reported because the passage of AB 919 in 1978 eliminated testing in grade two. Information about second-grade reading achievement from 1974-75 to 1977-78 can be found in the annual reports published for those years.

Reading Results for Grade Three

The results of third grade reading achievement for 1974-75 through 1978-79 are shown in Table 2. Changes in performance from year to year are also presented in Table 2.

The following conclusions about changes in third grade reading performance are apparent from the results in Table 2:

- For the fourth consecutive year, third grade reading achievement improved--by 0.2 percent correct in the last year. Added to the previous gains, this year's increase resulted in an overall gain of 1.1 percent correct since the first administration of the Reading Test in 1974-75.
- From 1977-78 to 1978-79 all reading skills areas registered slight gains or remained the same. The largest gain occurred in the cluster of questions assessing study-locational skills (0.4 percent correct)

Table 2

Reading Scores of California Third Grade Students
on the Reading Test, 1974-75 through 1978-79

Skill area	Number of questions	Average percent correct					Change			
		1974-75	1975-76	1976-77	1977-78	1978-79	1974-75 to 1975-76	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
TOTAL READING	250	81.3	81.4	81.7	82.2	82.4	+0.1	+0.3	+0.5	+0.2
Word Identification	60	85.8	85.6	85.9	86.3	86.4	-0.2	+0.3	+0.4	+0.1
Sight words	5	92.7	92.6	92.9	93.5	93.5	-0.1	+0.3	+0.6	-0-
Phonetic analysis	45	86.1	85.9	86.2	86.5	86.6	-0.2	+0.3	+0.3	+0.1
Structural analysis	10	80.9	80.8	81.1	81.8	82.1	-0.1	+0.3	+0.7	+0.3
Vocabulary	60	82.6	82.9	83.4	83.9	84.1	+0.3	+0.5	+0.5	+0.2
Comprehension	110	77.0	76.7	77.1	77.6	77.8	-0.3	+0.4	+0.5	+0.2
Literal	77	77.9	77.5	78.0	78.5	78.7	-0.4	+0.5	+0.5	+0.2
Interpretive	33	74.9	74.9	75.0	75.5	75.8	-0-	+0.1	+0.5	+0.3
Study-locational	20	88.0	88.0	88.8	89.6	[illegible]	-0-	+0.8	+0.8	+0.4

Analysis and Interpretation of Skill Area Results

Members of the Reading Assessment Advisory Committee analyzed, interpreted, and evaluated the 1978-79 reading results. In this process they weighed such factors as the inherent difficulty of the skills, the particular items used to assess each skill, and changes in performance since 1974-75. Guided by an understanding of the kinds of errors pupils were making, the committee members concluded their analysis with implications for instruction.

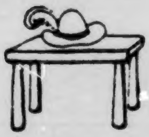
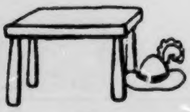
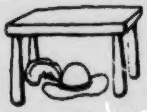
Literal comprehension. The Reading Test is designed to measure two broad categories of reading comprehension. The first of these, literal comprehension, is defined as the locating or remembering of explicit elements stated in written material. Thus, the 77 literal comprehension questions required third graders to identify the meaning of words, sentences, and short paragraphs.

Members of the committee observed that scores were extremely high on a cluster of questions that required students to identify the meaning of an isolated sentence.

The score on the following test item was typical of third grade performance on the sentence comprehension questions:

Example A

The hat is under the table.

○ ○ ●

(4) (1) (95)

The data on this question and others like it reveal that 95 percent of the third graders have learned to read short, simple isolated sentences composed of easily decodable words. However, when literal questions were based upon sentences contained within paragraphs (as is the case with most of the literal questions), performance levels were somewhat lower. Example B illustrates average performance in the literal comprehension category for grade three.

Example B

Read the story and answer the questions.

Susan had a dream. She dreamed she was a grocer. Her store was just like a real store, but she was a strange grocer. She did not sell her groceries. She gave them away. The people thanked Susan by giving her tickets to the movies. Soon she had many tickets, and she took many boys and girls to the movies.

The people thanked Susan by

- ○ saying "Thank you." (16)
- ● giving her tickets. (79)
- ○ giving her flowers. (5)

In Example B choosing the correct answer required (1) locating the key sentence (underlined here for the reader's convenience); and (2) identifying among the choices the answer that was given verbatim in the underlined sentence. While this question is still a test of sentence comprehension (like Example A), a good deal of difficulty is added evidently once that sentence is embedded in a paragraph. On this more difficult item, over three-fourths of the third graders responded correctly, as the data reveal. Thus, it appears that a majority of third graders are able to handle the very basic, verbatim kinds of literal comprehension questions derived from a single sentence within a short, simple paragraph.

Members of the committee observed that additional difficulty arises when pupils are required to draw relationships between words in a sentence, or between sentences in a paragraph. Consider, for example, the following passage which contains all the information needed to answer the question (underlined here for the reader's convenience).

Example C

> **Read the story and answer the questions.**
>
> **Father and Mother Seal lived in the cold North. They had a "puppy," as a baby seal is called. The seal family lived on a big iceberg with cold water all around them. Mother Seal went down into the water to catch fish. Father Seal did not fish. He lived on the fat under his skin. Mother Seal taught her puppy to swim so he could catch his own food.**
>
> In this story, the puppy is a little
>
> ○ dog. (21)
> ○ fish. (4)
> ● seal. (75)

To find the answer in this item, however, pupils must relate "puppy" and "baby seal" by use of the conjunction "as," an operation that involves an understanding of a slightly more complex sentence structure. Over one-fourth of the third graders failed to demonstrate this understanding. Thus, members of the committee concluded that primary grade students need specific instruction in the meaning of conjunctions and the relationships between words in more complex sentence structures to ensure that pupils learn to derive meaning from context clues as in Example C.

A test item that required students to relate the words from one sentence to those in another sentence is shown as Example D:

Example D

> **Read the story and answer the questions.**
>
> **Did you ever see a mouse that could fly? A bat is sometimes called a flying mouse.**
>
> **A bat is a furry animal. It has no feathers. Instead, its wings are made from skin. The skin stretches from the tips of its front legs to the tips of its back legs.**

Some bats are as tiny as mice. Others can spread their wings nearly as wide as an eagle can.

A bat is not like flying fish or flying squirrels. Those animals glide only a little way. But a bat is like birds and some insects. It can stay up in the air as long as it wants to.

Flying squirrels can

- ○ glide as long as they want. (16)
- ● glide only a little way. (63)
- ○ fly like birds. (11)
- ○ fly like bats. (10)

To find the answer in this item, the pupils had to put together two sentences (underlined here for the reader's convenience), a process that involved following "Those animals" back to "flying fish and flying squirrels." As is apparent from the data, over one-third of the third graders failed to accomplish this task. On the basis of scores on this question and others like it, members of the committee concluded that students would profit by more specific instruction and practice in recognizing the relationship between a pronoun and its antecedent.

Interpretive-critical comprehension. Interpretive-critical comprehension is the second and higher level of reading comprehension that the Reading Test is designed to assess. Items in this area required the reader to use the explicit information in the reading material to reach a conclusion not stated in the material. Thus, the 33 interpretive-critical comprehension questions required pupils to make judgments, predict outcomes, infer main ideas, or draw some other kind of inference.

The following three questions, all based on the same passage, reveal how scores drop, as comprehension questions shift from the literal to the inferential.

Read the story and answer the questions.

Some nature museums lend animals to children to take home. Some of the animals are wild. The museums lend snakes, opossums, and raccoons. Wild animals like these are taken home in locked cages.

Wild animals may be kept one day. Tame animals such as rabbits and kittens may be kept a whole week. Rules come with the pets. The rules tell how to feed, clean, and handle the animals.

Example E

The story says that these
lend animals.

(15) ○ zoos
(82) ● museums
(3) ○ circuses

Example F

How long could you keep
a puppy?

(19) ○ two weeks
(16) ○ one day
(65) ● one week

Example G

The best name for the story is

(41) ● Pets to Lend
(13) ○ Caring for Pets
(46) ○ Wild and Tame Animals

Example E is a very literal comprehension question which is based entirely upon the information stated in the first sentence of the first paragraph (underlined here for the reader's convenience). Consistent with their performance on another item of this type (Example B), over three-fourths of the third graders correctly answered this question. Thus, we have another illustration of third graders' ability to successfully handle explicitly stated literal details (especially if the detail is not buried in the middle of a lengthy paragraph).

The item in Example F is measuring interpretive-critical comprehension. On this question, students must recognize that a puppy is a tame animal, like a rabbit or kitten, and could be borrowed from the lending museum for one week. As the data reveal, less than two-thirds (65 percent) of the third graders successfully arrived at this conclusion.

Example G required pupils to draw yet another inference. This item asked pupils to select the best name for the story, and thus constituted a discriminating test of their ability to infer the main idea of the story. While third graders had little difficulty with several questions involving more literal main ideas (in which the main idea is clearly stated within the paragraph), only 41 percent selected the correct response to the inferential main idea question in Example G. This pattern of strength and weakness (examples E through G) appeared on a number of test passages throughout the third grade reading results. From this, the reading committee concluded that while most third graders were able to recognize explicitly stated information and literal main ideas, they had more difficulty drawing various kinds of inferences from the material they read.

Summary of the Committee's Observations, Conclusions, and Recommendations

Members of the Reading Assessment Advisory Committee were gratified to see another year of improved reading achievement scores in the third grade. In the process of reviewing the third grade results item by item, the committee members reached the following conclusions:

1. The vast majority of third graders can identify the meaning of short, isolated sentences composed of easily decodable words.

2. A majority of third graders can locate and identify explicit information stated within a single sentence embedded in a short, simple paragraph. Some of the obstacles to higher literal comprehension scores appear to be difficulties in putting sentences and sentence parts together through the use of conjunctions and pronouns. For example, items causing some difficulty were ones which had pronouns, such as "it" or "those," that referred back to words in a preceding sentence.

3. While most third graders were able to recognize explicitly stated information and literal main ideas, they had more difficulty drawing various kinds of inferences from the material they read, that is, finding meaning that was not explicitly stated. This difficulty, for example, is seen when pupils were asked to read the whole selection and choose the most appropriate title or to put together information in the material read to form a new idea that was not stated.

These strengths and weaknesses observed by the committee in the third grade reading results are summarized in Figure 2 on the following page.

After examining the kinds of errors that pupils are making, the committee recommended that students receive increased experience and instructional assistance in the following:

- Comprehending, manipulating, and paraphrasing sentences to increase pupils' understanding of how sentences and sentence parts fit together (with special emphasis on connecting words, such as conjunctions and pronouns)

- Drawing inferences of all kinds (including getting the main idea, sensing cause and effect relationships, making judgments, and applying information to new situations) from a broad variety of reading materials

Figure 2

Committee Judgments of Third-Grade Skill Area Results

Area of strength	Area in need of improvement
Comprehending short, simple sentences presented outside a paragraph (Example A)	Understanding how sentences and sentence parts are connected through the use of conjunctions and pronouns (examples C and D)
Identifying explicit details stated within a single sentence embedded in a short, relatively simple paragraph (examples B and E)	Inferring main ideas (Example G) and deriving inferences from details (Example F)
Recognizing literal main ideas of short, simple passages	

Reading Results for Grade Six

Test Scope

The reading section of the Survey of Basic Skills: Grade 6 consists of 128 questions. The items were selected to assess the students' attainment of a wide variety of objectives discussed broadly in Framework in Reading for the Elementary and Secondary Schools of California (Sacramento: California State Department of Education, 1973) and specified, with the help of the Reading Assessment Advisory Committee, in Test Content Specifications for California State Reading Tests (Sacramento: California State Department of Education, 1975). Both the objectives and the questions used to assess them fall into one of five major skill areas: word identification, vocabulary, literal comprehension, interpretive-critical comprehension, and study-locational skills. The emphasis assigned to each of the reading skill areas in the Survey of Basic Skills: Grade 6 is presented graphically in Figure 3.

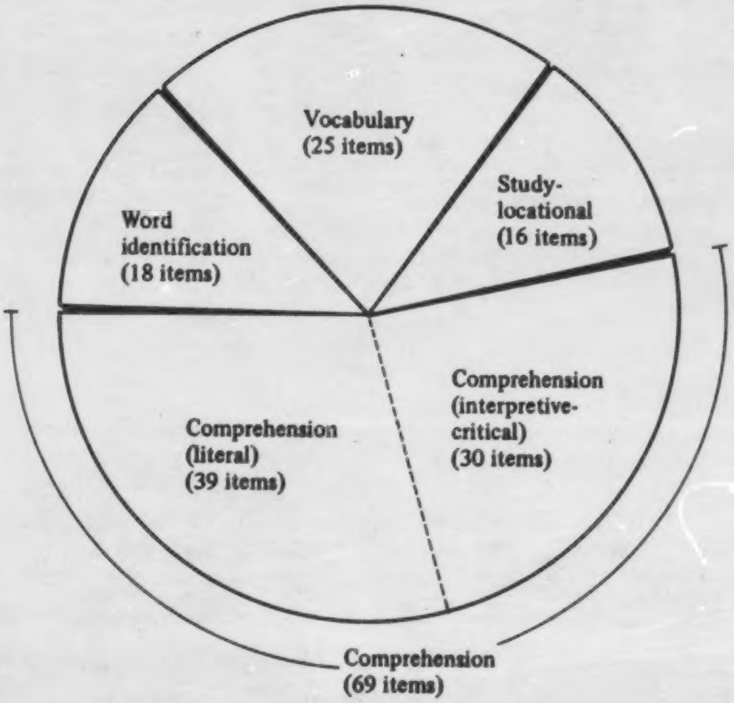


Fig. 3. Number of questions, by skill area, in the reading portion of the *Survey of Basic Skills: Grade 6*

Reading Results for Grade Six

The results of sixth grade performance on the total reading test and in each of the skill areas for 1975-76, 1976-77, 1977-78, and 1978-79 are presented in Table 3. Year-to-year changes in overall performance and in skill area performance are also shown in the table.

Table 3

Reading Scores of California Sixth Grade Students on the Survey of Basic Skills: Grade 6

Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
READING, TOTAL	128	66.1	65.9	66.3	66.8	-0.2	+0.4	+0.5
Word identification	18	74.3	74.2	74.7	75.2	-0.1	+0.5	+0.5
Vocabulary	25	67.1	66.3	66.9	67.3	-0.8	+0.6	+0.4
Comprehension	69	64.9	64.9	65.2	65.6	-0-	+0.3	+0.4
Literal	39	67.4	67.2	67.5	67.9	-0.2	+0.3	+0.4
Interpretive-critical	30	61.8	62.0	62.2	62.6	+0.2	+0.2	+0.4
Study-locational	16	60.0	59.8	60.5	61.8	-0.2	+0.7	+1.3

The following observations about changes in achievement are evident from an examination of the data in Table 3:

- From the spring of 1978 to the spring of 1979, sixth grade reading test scores improved by 0.5 percent correct. This was the second consecutive year sixth-grade reading achievement improved, resulting in an increase of 0.9 percent correct since the spring of 1977. However, the slight decline in achievement (0.2 percent correct) from 1975-76 to 1976-77 yielded an overall change of 0.7 percent correct since the first year the test was administered.

- From the spring of 1978 to the spring of 1979, increases were registered in all reading skill areas, the largest of which occurred in study-locational skills (1.3 percent correct).

Analysis and Interpretation of Skill Area Results, Grade Six

The members of the Reading Assessment Advisory Committee analyzed, interpreted, and evaluated the 1978-79 reading results. In this process they considered such factors as the inherent difficulty of the skills, the particular items used to assess each skill, and changes in performance since 1975-76. Guided by an understanding of the typical errors made by sixth graders, members of the committee concluded their analysis with instructional recommendations.

Word identification. Most of the word identification questions on the Survey of Basic Skills: Grade 6 were written to measure students' knowledge of suffixes, roots, and prefixes. Members of the Reading Assessment Advisory Committee have stressed in past reports the importance of teaching these skills as key building blocks to reading comprehension. Therefore, members of the committee were pleased to see the improvement shown in this skill area from the spring of 1978 to the spring of 1979. However, committee members were still not satisfied with the proportions of students responding correctly on these questions. They expected, for example, nearly all of the sixth graders to recognize the meaning of the prefix un on the following question rather than the 74 percent that did so:

Example H

The toga was a loose outer garment worn by Roman citizens when they appeared in public. It was made of a single broad piece of undyed woolen cloth, usually cut in the shape of a semicircle. A large toga might contain from 10 to 20 square yards of cloth. The toga was draped about the body with the straight side thrown over the left shoulder. The help of a servant, and sometimes of more than one, was required to drape a large toga artfully. It was heavy and hot, and did not permit freedom of movement.

Togas were usually white in color. Some men, especially candidates for public office, had the cloth bleached to make it extra white. On festive occasions army generals and certain public officials wore red or purple togas embroidered with gold thread. A Roman boy wore a purple-bordered toga until sometime between the ages of 12 and 16, when he put away the toga of childhood and put on the plain white toga of manhood.

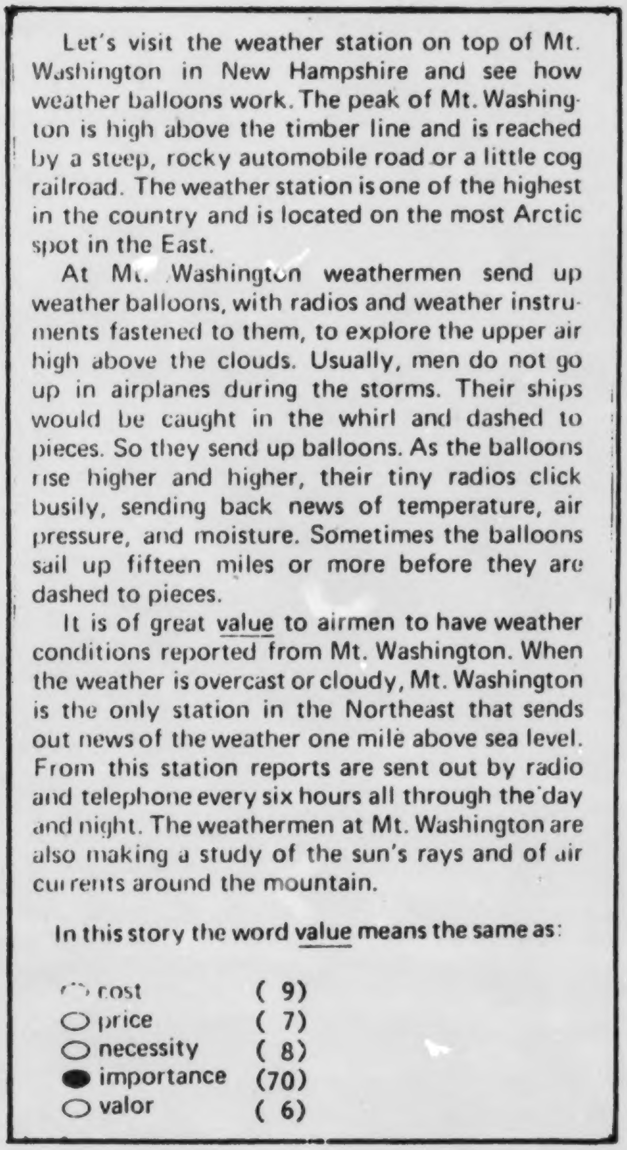
We know from the prefix un in the word undyed that the woolen cloth was

(6) ○ dyed apart.
(7) ○ dyed back.
(13) ○ dyed over again.
(74) ● not dyed.

The committee concluded from the percent correct scores on questions such as this one that more emphasis is needed throughout the elementary grades on basic word-building skills (such as recognizing the meaning, use, and spelling of words with prefixes and suffixes). This judgment was corroborated by the members of the English Language Assessment Advisory Committee in their analysis of sixth grade spelling results (see page 54).

Vocabulary. The 25 vocabulary questions on the sixth grade reading test required students to identify the meanings of words as they were used in a paragraph. Members of the committee were pleased to see the improvement in scores from 1977-78 to 1978-79. However, they judged that performance in this area should still be higher. For example, less than three-fourths of the sixth graders demonstrated an understanding of the word "value" in the following item:

Example I



Let's visit the weather station on top of Mt. Washington in New Hampshire and see how weather balloons work. The peak of Mt. Washington is high above the timber line and is reached by a steep, rocky automobile road or a little cog railroad. The weather station is one of the highest in the country and is located on the most Arctic spot in the East.

At Mt. Washington weathermen send up weather balloons, with radios and weather instruments fastened to them, to explore the upper air high above the clouds. Usually, men do not go up in airplanes during the storms. Their ships would be caught in the whirl and dashed to pieces. So they send up balloons. As the balloons rise higher and higher, their tiny radios click busily, sending back news of temperature, air pressure, and moisture. Sometimes the balloons sail up fifteen miles or more before they are dashed to pieces.

It is of great value to airmen to have weather conditions reported from Mt. Washington. When the weather is overcast or cloudy, Mt. Washington is the only station in the Northeast that sends out news of the weather one mile above sea level. From this station reports are sent out by radio and telephone every six hours all through the day and night. The weathermen at Mt. Washington are also making a study of the sun's rays and of air currents around the mountain.

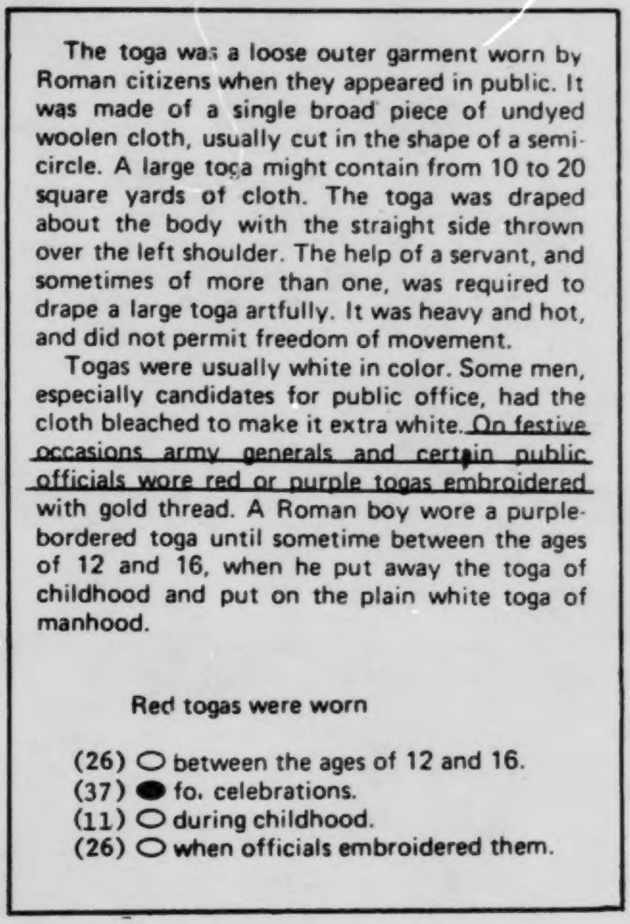
In this story the word value means the same as:

○ cost	(9)
○ price	(7)
○ necessity	(8)
● importance	(70)
○ valor	(6)

Some members of the committee were disappointed with the percent of students responding correctly on this item and other familiar vocabulary items, such as "skeleton," "harvest," and "average."

Furthermore, committee members observed low scores on some comprehension questions which were designed to assess knowledge of word meanings. The following is an example:

Example J



The toga was a loose outer garment worn by Roman citizens when they appeared in public. It was made of a single broad piece of undyed woolen cloth, usually cut in the shape of a semicircle. A large toga might contain from 10 to 20 square yards of cloth. The toga was draped about the body with the straight side thrown over the left shoulder. The help of a servant, and sometimes of more than one, was required to drape a large toga artfully. It was heavy and hot, and did not permit freedom of movement.

Togas were usually white in color. Some men, especially candidates for public office, had the cloth bleached to make it extra white. On festive occasions army generals and certain public officials wore red or purple togas embroidered with gold thread. A Roman boy wore a purple-bordered toga until sometime between the ages of 12 and 16, when he put away the toga of childhood and put on the plain white toga of manhood.

Red togas were worn

(26) ○ between the ages of 12 and 16.
(37) ● for celebrations.
(11) ○ during childhood.
(26) ○ when officials embroidered them.

Careful study of Example J revealed that the question was derived entirely from one sentence (underlined here for the reader's convenience). Arriving at the correct answer required understanding the meaning of "festive occasions." Probably a lack of vocabulary knowledge hindered many students in their performance on this item. Thus, sixth grade achievement on a variety of vocabulary and comprehension questions led the committee to conclude that more intensive work in word study and vocabulary development is needed to ensure maximal growth for elementary pupils in reading comprehension.

Committee members were even more concerned about the number of students who failed to make use of obvious and explicit context clues in deciphering word meanings, as in the following example:

Example K

Can bees see colors? If they can, color vision is probably useful to them. If bees can see colors, they probably find flowers more easily. Bees fly from flower to flower gathering nectar, a sweet substance used in making honey. In the process they transfer pollen from flower to flower. If it were not for the pollinating process, plants couldn't make seeds.

To find out if bees can see color, some investigators placed two squares of paper—one blue and one green—in the bottom of a cage of bees. They set a tiny dish on each square. They filled the dish on the blue square with a solution of sugar and water and left the dish on the green square empty.

At first the bees landed on both squares. But soon they were all clustered on the blue square, feeding on the sugar water. After a while the investigators emptied the dish of sugar water but left the dish in the cage. The bees still landed only on the blue square. Even when the squares were moved to different places in the cage, the bees went to the blue square.

The investigators knew, however, that many animals can't see color; they see things only in different shades of gray. Perhaps the bees could tell the squares apart because they saw green and blue as different shades of gray. The investigators replaced the green square with many gray squares, each a different shade. On each gray square they put an empty dish; on the one blue square they also put an empty dish. As before, the bees landed only on the blue square.

The word nectar means:

(78) ● a sweet substance
(9) ○ honey
(11) ○ pollen
(2) ○ seeds

Some members of the committee speculated that many students who missed this item may have been confused by the sentence structure since the context clue was presented as an appositive. The committee members concluded that specific instruction in understanding more complex sentence structures is likely to be an important strategy for helping children learn to take advantage of context clues.

Literal comprehension. The Survey is composed of two broad categories of reading comprehension questions. The first category, literal comprehension, is defined as identifying or remembering explicitly stated elements in the material read. Most literal comprehension items asked students to identify a single fact presented in the reading material, and several of these required fairly close reading and careful discriminations. Members of the committee observed that most students did very well on basic, literal questions dealing with isolated details, as in the following example:

Example L

A new kind of star is shining over New York City. It is at the top of a tall, steel tower on an office building. It can be seen from a distance of five miles and tells by changing its color what kind of weather New York City is going to have. Clear weather is coming if the star is green. Orange means the weather will be cloudy. If the star is flashing orange, New York children wear rubbers and raincoats because rain is on the way. When the star is flashing white, snow is on the way and children get out their sleds. This is the most modern way to predict what the weather is going to be. For a long time radio and newspapers were the principal sources of information concerning the weather. Now a new way has been found.

How would you like to have a star tell you when you can go on your picnic? Maybe the star will tell you the weather is unsuitable and you will have to eat your picnic lunch inside.

A green star shining atop the building means

(3) ○ children should wear their boots.
(2) ○ snow.
(92) ● clear weather.
(3) ○ children should get out their sleds.

All of the information needed to answer this question is contained within a single sentence (underlined in the passage for the reader's convenience). However, the following question, based upon the same passage, proved to be more difficult:

Example M

What can be seen from a distance of five miles?

(5) ○ New York City
(14) ○ A steel tower
(4) ○ An office building
(77) ● A new kind of star

This questions was derived from the first three sentences of the passage shown with Example L. The literal comprehension task in this item involved relating the word "It" in the third sentence to its referent, "A new kind of star," in the first sentence. Thus, while over 90 percent of the students were able to answer successfully the question in Example L, which was based upon one sentence, only about three-fourths of the students successfully related words from sentence to sentence in Example L. Thus, some committee members concluded that more intensive and specific instruction in helping students understand and follow relationships between words (as from the pronoun to its referent in Example M) is a key strategy for improving comprehension.

Interpretive-critical comprehension. The second broad category of comprehension questions appearing on the Survey is a higher level of reading skill: interpretive-critical (or inferential) comprehension. In interpretive-critical comprehension, a reader uses the explicit information in a passage along with his or her personal experiences and thinking abilities to predict, generalize, compare, judge, infer, and create ideas. Thus, the 30 interpretive-critical comprehension questions on the Survey required students to glean from a passage some conclusion that was not explicitly stated. As one might expect, the questions in this skill area were more difficult for students than those in any of the foregoing skill areas. The average percent correct in this area was 62.6. Scores ranged from a high of 92 to a low of 31.

The 92 percent correct score was achieved on the question in Example N. This item was based upon a passage that is probably representative of some of the easier reading materials encountered by sixth-graders. The questions asked students to determine what the story was mostly about. Since all the options given were mentioned in the passage, the students had to weigh the various choices and decide which one represented the main idea. Thus, the item appears to be a good test of the students' overall comprehension of the passage.

Example N

My name is James, same as my father's. My mother calls me Jimmy. My father is called Jim. He always wakes me up in the morning. He calls me Jim. I hope I'm like him when I grow up.

My father works as a plumber's helper, and for extra money, he is a night watchman. Mother says that Daddy works very hard to make us happy, and Daddy says the same thing about Mother. Both Daddy and Mother say that we make them happy because we are their children.

On Sunday we all go to church together—my father, mother, my older sister, and my younger brothers, Jerry and Willie, and I. When we come home, we have a good dinner. We have fun on Sundays. Daddy and Mother don't have to go to work then. They have time to play with us or take us for a ride in the car.

The story tells the most about

(1)○ what a plumber does.
(92)● a happy family.
(2)○ going to church.
(5)○ a hard job.

Another interpretive-critical comprehension question based upon the same passage presented more difficulty. This question (Example O) required students to make an inference from a detail provided in the first sentence of the third paragraph (underlined in the passage for the reader's convenience).

Example O

You can tell from the story that James is the

(8) ○ oldest child.
(73) ● second oldest child.
(11) ○ third oldest child.
(8) ○ youngest child.

While 92 percent successfully identified the main idea of the passage, only 73 percent of the students reached a correct conclusion from a detail contained within the same passage. Thus, 27 percent failed to make the correct inference from the key information or failed to locate the sentence containing the key information in the first place.

The item below (Example P) illustrates a more difficult interpretive-critical question.

Example P

The toga was a loose outer garment worn by Roman citizens when they appeared in public. It was made of a single broad piece of undyed woolen cloth, usually cut in the shape of a semicircle. A large toga might contain from 10 to 20 square yards of cloth. The toga was draped about the body with the straight side thrown over the left shoulder. The help of a servant, and sometimes of more than one, was required to drape a large toga artfully. It was heavy and hot, and did not permit freedom of movement.

Togas were usually white in color. Some men, especially candidates for public office, had the cloth bleached to make it extra white. On festive occasions army generals and certain public officials wore red or purple togas embroidered with gold thread. A Roman boy wore a purple-bordered toga until sometime between the ages of 12 and 16, when he put away the toga of childhood and put on the plain white toga of manhood.

On which occasion would the toga least likely be worn?

○ In the public market (22)
○ In a Roman temple on a holiday (24)
○ At a banquet for a group of boys (12)
● At a family meal (42)

To answer this item correctly, students needed to (1) comprehend from the first sentence of the passage that togas were worn in public; and (2) judge which of the four options listed in the item were not public occasions. Thus, students had to understand what they read and apply their understanding to new material not discussed in the passage. As the data reveal, less than half (42 percent) were able to handle this kind of comprehension question. Scores on items like this one and uneven performance throughout the interpretive-critical comprehension skill area prompted the members of the Reading Assessment Advisory Committee to judge this area in need of greater instructional emphasis.

Summary of Committee's Conclusions and Recommendations

The members of the Reading Assessment Advisory Committee were pleased to see the gains registered on the overall sixth grade reading results and in all the reading skill areas from 1976-77 to 1978-79.

They observed that most sixth graders can perform successfully on very basic, literal questions dealing with isolated details and main ideas based upon relatively easy material. Performance starts to drop off as soon as the questions begin to place demands upon students' knowledge of word meanings, understanding of more complex sentence structures, ability to follow the relationships between sentences, and ability to draw inferences.

The pattern of strengths and weaknesses discerned by the committee members in their analysis of the sixth-grade reading results is summarized in Figure 4.

Figure 4

Committee Judgments of Sixth-Grade Skill Area Results

Area of strength	Area in need of improvement
Identifying explicitly stated details from one or two sentences within a paragraph (Example L) Recognizing the main idea of a relatively easy paragraph (Example N)	Recognizing word meanings (examples H, I, and K) Putting sentences and sentence parts together (examples K and M) Drawing various kinds of inferences from written material (examples O and P)

After reviewing the statewide pattern of strengths and weaknesses within the sixth-grade reading results, members of the Reading Assessment Advisory Committee recommended that students receive increased instructional assistance in the following:

- Word study and vocabulary development (including word-forming skills involving the spelling, meaning, and use of words based upon roots, prefixes, and suffixes)
- Location of an idea within one or more sentence structures (including the relationship between an appositive and its referent--see Example K and the relationship between a pronoun and its referent--see Example M)

- Inferential and critical comprehension (including inferring, interpreting, and evaluating information and ideas stated in written material)

Reading Results for Grade Twelve

Test Scope

The reading section of the Survey of Basic Skills: Grade 12 consisted of 141 questions. These items were designed to assess the students' attainment of a wide range of objectives discussed broadly in Framework in Reading for the Elementary and Secondary Schools of California and specified, with the help of the Reading Assessment Advisory Committee, in Test Content Specifications for California State Reading Tests. As shown in Figure 5, both the objectives and the questions used to assess the achievement of the objectives fall into one of four reading skill areas: vocabulary, literal comprehension, interpretive-critical comprehension, and study-locational skills. Figure 5 is also an illustration of the emphasis placed on each of the reading skill areas in the Survey of Basic Skills: Grade 12.

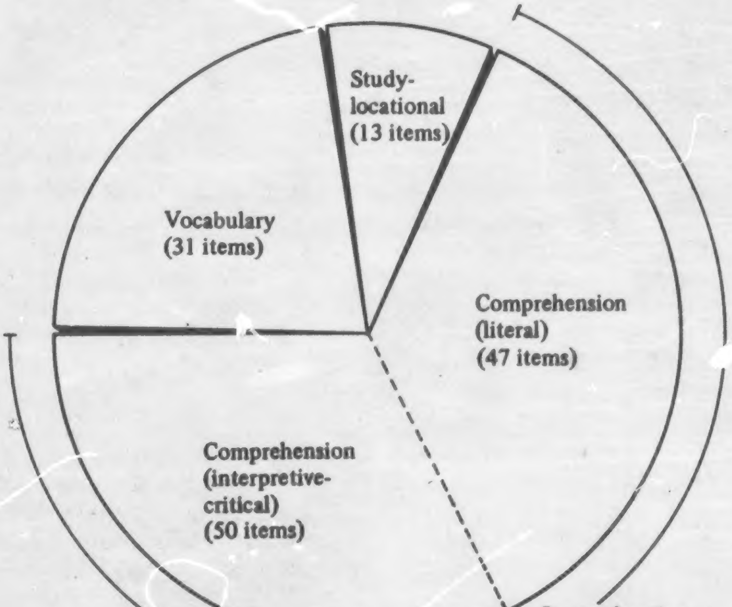


Fig. 5. Number of questions, by skill area, in the reading portion of the *Survey of Basic Skills: Grade 12*

Reading Scores for Grade Twelve

The results of twelfth grade performance on the total reading test and in each of the skill areas for 1975-76, 1976-77, 1977-78, and 1978-79 are presented in Table 4. Year-to-year changes in overall performance and in skill area performance are also shown in the same table.

Table 4

Reading Scores of California Twelfth Grade Students on the Survey of Basic Skills: Grade 12

Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
READING, TOTAL	141	64.1	63.6	63.3	63.2	-0.5	-0.3	-0.1
Vocabulary	31	61.3	60.9	60.5	60.2	-0.4	-0.4	-0.3
Comprehension	97	64.5	63.9	63.7	63.7	-0.6	-0.2	-0-
Literal	47	69.2	68.9	68.5	68.6	-0.3	-0.4	+0.1
Interpretive-critical	50	60.1	59.3	59.2	59.0	-0.8	-0.1	-0.2
Study-locational	13	68.4	67.2	67.3	67.4	-1.2	+0.1	+0.1

The following observations about the changes in twelfth grade reading achievement are evident from an examination of the data in Table 4:

- For the third consecutive year, twelfth grade reading achievement declined; however, each year the decline has been less than the year before. The decrease from 1977-78 to 1978-79 (0.1 percent) was slightly less than the decrease of the previous year (0.3 percent), which was still less than the decrease of the previous year (0.5 percent), yielding an overall decline of 0.9 percent correct from 1975-76 to 1978-79

- From 1977-78 to 1978-79 slight declines were registered in all reading skill areas except in the areas of literal comprehension and study-locational skills, where a slight increase of 0.1 percent correct was registered for each area. The largest decline was in the area of vocabulary (0.3 percent).

Analysis and Interpretation of Skill Area Results, Grade Twelve

The members of the Reading Assessment Advisory Committee reviewed the twelfth grade results item by item as they did for the other grade levels. The committee identified some basic kinds of reading exercises that most twelfth graders performed successfully as well as some types of questions which revealed recurring patterns of difficulty. Members of the committee concluded their analysis with recommendations for reading instruction.

Literal comprehension. The first broad category of reading comprehension skills assessed by the *Survey* was literal comprehension, defined as remembering or locating elements stated explicitly in a reading selection. The 47 literal comprehension questions required students to demonstrate their understanding of what they read by selecting either a restatement or paraphrase of words, sentences, or paragraphs. The committee members were encouraged that at least for literal comprehension, a slight gain was shown.

A few of the literal questions on the *Survey* required students to identify an isolated fact from materials one might have to read in everyday life (such as an automobile insurance policy, a recipe, and directions for treating poison ivy). Example Q is a literal comprehension test item, including the percent of students who chose each of the options.

ENGLISH MUFFINS

1 package active dry yeast
½ cup warm water
1½ cups milk, scalded
2 tablespoons sugar
2 teaspoons salt
¼ cup shortening
5¾ to 6 cups sifted all-purpose flour

Soften yeast in water. Combine next 4 ingredients; cool to lukewarm. Stir in *2 cups* flour; beat well. Add yeast; mix. Add enough of remaining flour to make a moderately stiff dough. Turn out on a lightly floured surface; knead till smooth (8 to 10 minutes). Place in lightly greased bowl, turning dough once. Cover; let rise till double (1¼ hours).

Punch down; cover and let rest 10 minutes. Roll to slightly less than ½ inch thick on lightly floured surface. Cut with a 3-inch round cutter. (Reroll edges.) Cover and let rise till very light (1¼ hours). Bake on top of range on medium hot greased griddle; turn frequently till done, about 30 minutes. Cool thoroughly. Split with a fork; toast on both sides. Serve at once. Makes 2 dozen.

How long does it take to bake English muffins on top of range?

(3) ○ 8 to 10 minutes ○ 1¼ hours (5)
(0) ○ Exactly 10 minutes ○ More than 3 hours (2)
(90) ● About 30 minutes

Similarly, on several other questions based upon everyday reading materials, scores were quite high as in Example Q. Moreover, on the majority of literal questions based upon academic materials (historical, scientific, and literary selections), scores of at least 70 percent correct were obtained. Thus, members of the committee concluded that most twelfth graders can perform adequately on literal questions requiring them to locate isolated facts or details from everyday and academic reading materials.

In the further examination of questions with low percent correct scores, some members of the committee observed that a weak grasp of vocabulary appeared to be a source of difficulty for many twelfth graders (as it was for sixth graders). For example, the following item in Example R reveals that over one-half of the students did not understand the meaning of the word "famished" in this passage.

Example R

I Skiing has recently become one of the more popular sports in the United States. Because of its popularity, thousands of winter vacationers are flying north rather than south. In many areas, reservations are required months ahead of time.

II I discovered the accommodation shortage through an unfortunate experience. On a sunny Saturday morning I set out from Denver for the beckoning slopes of Aspen, Colorado. After passing signs for other ski areas, I finally reached my destination. Naturally I lost no time in heading for the nearest tow. After a stimulating afternoon of miscalculated stem turns I was famished. Well, one thing led to another and it must have been eight o'clock before I concerned myself with a bed for my bruised and aching bones.

III It took precisely one phone call to ascertain the lack of lodgings in the Aspen area. I had but one recourse. My auto and I started the treacherous jaunt over the pass and back toward Denver. Along the way, I went begging for a bed. Finally a jolly innkeeper took pity and for only thirty dollars a night allowed me the privilege of staying in a musty, dirty, bathless room above his tavern.

In paragraph II, "famished" means:

(2) ○ morose
(53) ○ tired
(43) ● hungry
(2) ○ hopeful

The disappointing score on Example R and on a variety of other vocabulary questions led members of the committee to conclude that students need more instruction in vocabulary development, including the multiple meanings and connotations of words, the use of context, and vocabulary in the content areas. To accomplish this, the committee added, students need to be encouraged to read widely and need to be motivated to keep learning new words.

Twelfth grade performance on the following vocabulary item, tested without a narrative context, is revealing in a different way:

Example S

Parallel to the horizon

(68) ● horizontal
(16) ○ vertical
(5) ○ diagonal
○ base (4)
○ meridian (7)

The scores on this question lead to two conclusions: (1) the obvious one, that over 30 percent of the twelfth graders do not know the meaning of the word "horizontal"; and (2) the more instructive one, that those unsure students failed to make use of the cue in the definition, the word "horizon," which is the root of the word "horizontal." Members of the committee recommended that the increased instructional emphasis in vocabulary development include a word-building component involving the spelling, use, and meaning of words based upon roots, suffixes, and prefixes. Members of the English Language Assessment Advisory Committee reached the same conclusion after reviewing the twelfth grade test results in spelling and written expression.

Literal comprehension is more than a knowledge of word meanings, however. It also involves the ability to follow the relationships between words, relationships that are signalled by structural cues within sentences and paragraphs. For example, some twelfth graders were still displaying confusion on questions which required them to follow the relationship between a pronoun and its referent. The following question is an illustration of this difficulty:

Example T

APPARENTLY WITH NO SURPRISE

Apparently with no surprise
To any happy flower,
The frost beheads it at its play
In accidental power.
The blond assassin passes on,
The sun proceeds unmoved
To measure off another day
For an approving God.

by Emily Dickinson

The "it" in line three is

○ the accidental power. (8)
● the happy flower. (84)
○ an approving God. (3)
○ the sun. (5)

Understanding this poem involves recognizing that the "it" in line three refers back to the "flower." Just as many third and sixth graders encountered difficulty with items involving pronoun reference, so too are some twelfth graders (16 percent) still displaying confusion on this kind of literal comprehension questions. On the basis of test data at grades three, six, and twelve, the committee judged that many students at all grade levels would benefit from focussed instruction in following the reference of a pronoun back to its antecedent. Example U illustrates a somewhat similar kind of difficulty:

Example U

The Director of the FBI wrote an article for the March 8, 1975, issue of *TV GUIDE* that started like this:

At 9:40 p.m. last July 24, as the House Judiciary Committee debated Presidential impeachment charges before millions of television viewers, a bomb threat came into the Capitol switchboard. The hearing room was cleared and, during the precautionary search, newspeople quite properly reported the threat to vast network audiences.

. . .

> A television newsman commented, somewhat stoically I thought, to the effect that "Simply by reporting it, we may well be encouraging someone else to telephone a bomb threat."
>
> The newsman was correct. Beginning that evening there were seven telephoned threats to obliterate the Committee, all apparently generated by the instant, nationwide exposure given the initial threat.
>
> The news about the first bomb threat was reported over television
>
> (16) ○ as the threat was being called in.
> (24) ○ as the room was being cleared of people.
> (55) ● during the search for the possible bomb.
> (5) ○ after it had been determined that there was no bomb.

On this item students needed to recognize that the phrase "during the precautionary search" modifies the word "reported" and thus indicates that the search and the reporting were going on at the same time. The data on this question suggest that many students failed to comprehend this structural clue. It may be that the error rate on this relatively easy item was due, at least in part, to difficulty following such relationships between words.

After reviewing student performance on examples T and U, and others like them, members of the committee concluded that students need specific instruction designed to help them understand relationships between words, sentences, and paragraphs in their reading.

Interpretive-critical comprehension. A higher level reading skill, interpretive-critical comprehension, is assessed by 50 questions on the Survey. In interpretive-critical comprehension, a reader uses the explicit information in the selection to make predictions, form generalizations, reach conclusions, make comparisons, form judgments, and create new ideas. All other things being equal, interpretive-critical comprehension questions should be more difficult than the purely literal because the reader is required to make inferences.

This proved to be the case on the Survey of Basic Skills: Grade 12, on which students averaged 59.0 percent correct in the interpretive-critical skill area (in contrast to 68.6 percent correct for the literal). Members of the reading committee were disturbed that the 1978-79 results showed a third year of decline in this essential area of comprehension.

Members of the committee observed that twelfth graders were typically more successful at drawing inferences about the main idea or entire meaning of a passage than they were at making inferences from details within a passage. This pattern is illustrated by the following two test items based on the same selection:

Example V

The thirty years from 1455 to 1485 were a period of almost constant civil war between the supporters of two branches of the royal family—the house of Lancaster and the house of York. This fighting is usually called the War of the Roses, because the house of Lancaster had a red rose as its badge, and the house of York a white rose. At the end of it, Henry Tudor, who belonged to the Lancaster branch of the family, came to the throne as Henry VII. He married Elizabeth, who belonged to the York branch, and thus helped to heal the wounds of the prolonged conflict. Its chief result was the wiping out of many noble families and the reduction of the power of these lords and barons so that a king could have his own way without much trouble.

Henry VII's reign (1485–1509) was a time of rebuilding for England. He kept order in the country and strengthened the royal power by special courts and economical management. In his reign John Cabot made his famous trip across the Atlantic—the first of modern Europeans to see the continent of North America where Columbus had reached only the Carribean Islands. Henry's economy is seen in the entry in his diary when Cabot came back: "To hym that found the new isle, £10"—less than fifty dollars for discovering a continent—but of course Henry didn't know how important this discovery was going to be in the history of England.

A conclusion that can be drawn from this passage is that

(7) ○ the position of king of England was weaker after the War of the Roses.
(3) ○ explorers were handsomely paid in the time of Henry VII.
(4) ○ Henry VII was a navigator before he became king.
(86) ● Henry VII lived in a time of conflict and exploration.

Example W

According to the passage, Henry VII ruled at the time of

(31) ○ a revolution against the nobility.
(30) ○ the settlement of New England.
(25) ● the voyages of Columbus.
(14) ○ the destruction of the house of York.

Example V required students to demonstrate an understanding of the primary message of the material, whereas Example W required them to find a detail relating to the time period in the passage and relate it to basic historical knowledge concerning the voyages of Columbus. While 86 percent of the twelfth graders succeeded on the former task, one-fourth of them successfully managed the latter.

The National Assessment of Educational Progress reported a similar finding:

> . . . individuals appear to be much more capable of drawing inferences about the entire meaning of a passage than they are of making specific inferences from phrases or sentences within a passage. (Reading in America: A Perspective on Two Assessments. Reading Report No. 06-R-01, October, 1976.)

Some interpretive-critical questions required students to infer the author's attitude or purpose. The ability to answer this kind of question correctly involves being aware of the way an author chooses words to create a particular feeling toward the topic. This critical reading skill is central to identifying the mood or tone of a selection as well as to detecting propaganda devices. The following item is an illustration of this kind of reading skill:

Example X

I Skiing has recently become one of the more popular sports in the United States. Because of its popularity, thousands of winter vacationers are flying north rather than south. In many areas, reservations are required months ahead of time.

II I discovered the accommodation shortage through an unfortunate experience. On a sunny Saturday morning I set out from Denver for the beckoning slopes of Aspen, Colorado. After passing signs for other ski areas, I finally reached my destination. Naturally I lost no time in heading for the nearest tow. After a stimulating afternoon of miscalculated stem turns I was famished. Well, one thing led to another and it must have been eight o'clock before I concerned myself with a bed for my bruised and aching bones.

III It took precisely one phone call to ascertain the lack of lodgings in the Aspen area. I had but one recourse. My auto and I started the treacherous jaunt over the pass and back toward Denver. Along the way, I went begging for a bed. Finally a jolly innkeeper took pity and for only thirty dollars a night allowed me the privilege of staying in a musty, dirty, bathless room above his tavern.

The author's love for skiing is suggested in which paragraph(s)?

(13) ○ I (8) ○ I and II
(43) ● II (35) ○ None of the paragraphs
(1) ○ III

Key words revealing the answer to this question are underlined.

As the item data reveal, less than half of the twelfth graders answered this question correctly. The low performance on this item and others like it may be related to weaknesses in language choices at both grades six and twelve (discussed in Chapter V under "Written Expression Results for Grades Six and Twelve"). Thus, evidence from both reading and written expression test results suggests that elementary and secondary students would profit from intensified instruction in the way in which deliberate word choices in writing can reveal the author's feeling toward the topic.

Summary of Committee's Observations, Conclusions, and Recommendations

Members of the Reading Assessment Advisory Committee were disappointed to see a third year of declining twelfth grade reading scores. In their analysis of the test results, they discerned the following pattern of strengths and weaknesses (which paralleled a number of points from the analyses of the grade six reading test results and grade twelve written expression test results):

- A majority of twelfth graders can identify isolated facts and details from a variety of academic and everyday reading materials. The two major obstacles to higher literal comprehension scores appear to be (1) difficulty in recognizing word meanings in context or through prefix, root, or suffix clues; and (2) difficulty in following such structural clues as pronoun references and prepositional phrases.

- Twelfth graders are typically more successful at inferring the main idea or overall meaning of a selection than they are at drawing conclusions from details within a passage. This finding was also reported by the National Assessment of Educational Progress in a report on national reading performance.

- Many twelfth graders are not adept at detecting the ways in which authors reveal their feelings toward a topic through careful word choices. This finding is all the more significant in light of the decline in the written expression skill area of language choices at both grades six and twelve.

This pattern of strengths and weaknesses is summarized in Figure 6.

Figure 6

Committee Judgments of Twelfth Grade Skill Area Results

Area of strength	Area in need of improvement
Identifying isolated facts and details in a variety of academic and everyday reading materials (Example Q) Recognizing the main idea of a paragraph (Example W)	Recognizing word meanings (examples R and S) Understanding structural relationships between words and sentences--such as following a pronoun back to its referent (examples T and U) Drawing inferences--such as drawing conclusions from details (Example W) and detecting the author's attitude (Example X)

The advisory committee concluded that the continuing decline in twelfth grade reading scores, especially in contrast to this year's increase in math and written expression, demonstrates the need for direct reading instruction in vocabulary and the comprehension skills in the context of every single subject area. As one committee member said, "Reading is not a subject. It is a skill which must be taught in every subject area." All members of the committee agreed that English, science, social studies, and math teachers need to work on vocabulary and especially on the higher inferential thinking skills within their disciplines.

Because of the continuing decline and uneven performance within the interpretive-critical comprehension skill area, members of the committee concluded that the higher reading and thinking skills are in need of special instructional emphasis. This judgment and the philosophy behind it are expressed in the following quotation from the Framework in Reading for the Elementary and Secondary Schools of California.

> The fullest comprehension requires rising above the literal to the inferential; that is, to induction, deduction, analogy, and other logical processes. It also invites individualistic, imaginative elaborations based on what the writer has suggested. These sets of competencies are sometimes called "thinking skills." Although these competencies are not unique to the reading process, they are essential to success in reading. They include such abilities as getting the main idea, separating fact from opinion, sensing cause and effect relationships, making judgments, and applying

> information to new situations. These competencies are developed in all areas of the school curriculum; but until they are successfully applied in the reading process, the major objectives in reading instruction cannot be achieved.

In addition to increased emphasis on the higher inferential comprehension skills, members of the committee suggested the following instructional emphases in response to the observable weaknesses within the twelfth-grade reading achievement results:

- Word-forming skills involving the spelling, meaning, and use of words based on roots, prefixes, and suffixes
- Vocabulary development in all the content areas
- The multiple meanings and connotations of words
- Use of careful word choices to reveal feelings and attitudes and to create special effects
- Use of context for deciphering word meanings
- Understanding the relationships between words within sentences and paragraphs (such as relating a pronoun to its referent and relating a prepositional phrase to the word it modifies)

The committee members recommended wide reading as one very effective method for helping students to increase their vocabulary and improve their comprehension skills. In addition, they recommended the sustained discussion of reading materials as a productive teaching strategy. Such discussions focussing on the details of word, sentence, and paragraph meaning are helpful in the development of both vocabulary and comprehension skills. The committee reiterated that all of the various vocabulary and comprehension skills should be taught within the context of all the content areas at the secondary level.

IV. Written Expression Achievement for Grades Six and Twelve

Synopsis of Findings

Both sixth and twelfth grade written expression achievement scores in California improved slightly from 1977-78 to 1978-79. Sixth grade written expression scores have registered improvement every year since 1974-75, when the Survey of Basic Skills was first administered. From 1977-78 to 1978-79 sixth grade written expression scores showed a gain of 0.5 percent correct, so that now the median sixth grade students is scoring at the 52nd percentile--two points above the national average.

Between 1969-70 and 1974-75 the median twelfth grade student in California dropped steadily from the 42nd percentile to the 32nd percentile on national norms in written expression. Since 1975-76, the median twelfth grade student has fluctuated between the 33rd and 34th percentiles, and in 1978-79, is scoring at the 34th percentile--16 points below the national average. See Chapter VII, "Comparisons with National Norms," for details.

Skill Area Strengths and Weaknesses

The members of the English Language Assessment Advisory Committee analyzed the test results to identify strengths and weaknesses in skill area performance. They concluded their analysis with instructional recommendations.

While the discussion of skill area strengths and weaknesses is based on the committee's judgments, the Department of Education accepts full responsibility for the interpretations in this report.

The committee's analysis of written expression skill area strengths and weaknesses are presented for both grades 6 and 12 in Figure 7.

Figure 7

Committee Judgments of Sixth and Twelfth Grade Skill Area Results

Area of strength	Area in need of improvement
Selecting the correct form of a word for a sentence--grades 6 and 12--(examples F, G, and Q) Discriminating between complete and incomplete sentences--grades 6 and 12--(examples J and T) Inserting punctuation in sentences where the sound of spoken English could be used as a guide--Grade 12--(Example O)	Spelling words with suffixes--grades 6 and 12--(examples B, C, M, and N) Inserting punctuation in sentences where a knowledge of a rule or convention is necessary--Grade 12--(Example P) Recognizing the most specific or general word in a group of words--grades 6 and 12--(examples H and S) Selecting a word which is most likely to convey a particular attitude or emotion--grades 6 and 12--(examples I and R) Identifying basic grammatical elements in sentences--Grade 12--(Example U) Recognizing the most effective and concise statement of an idea--Grade 12--(Example V) Achieving coherence in paragraphs--Grade 12--(examples W, X, Y, and Z)

Recommendations for Grade Six

Guided by an understanding of sixth graders' strengths, weaknesses, and most frequent mistakes, members of the committee offered the following broad instructional recommendations:

- A more efficient approach to teaching spelling is needed at the elementary level. Children should be exposed to homogeneous groups of words following similar spelling patterns so that they can more easily internalize generalizations that apply to many other words as well. Such instruction should include more emphasis on the generalizations pertaining to the spelling of words with suffixes. If students fail to form such basic generalizations in the third and fourth grades, where they are first introduced, these lessons should be retaught, reviewed, and practiced in the fifth and sixth grades.

- Some of the simplest capitalization rules pertaining to days of the week and months of the year need to be retaught and reinforced in the fourth, fifth, and sixth grades. Intermediate students also need more specific instruction in the skill of identifying all the words in a multiple-word proper noun and recognizing that all of them must be capitalized.

- Focussed instruction and skill-building practices are needed in the language choices skill area to help pupils understand some of the issues related to effective word choices. Pupils need this understanding if they are to write effectively, read critically, and be alert to propaganda devices in all the media.

Recommendations for Grade Twelve

Guided by an understanding of the difficulties students were having, the English Language Assessment Advisory Committee offered the following recommendations for teachers:

Spelling. A skill maintenance program in spelling for junior high and high school students is needed. Such a program should involve a highly structured approach to spelling instruction which would introduce words grouped according to spelling generalizations, particularly generalizations which apply to the formation of new words by the addition of suffixes to a base word. This kind of structure coupled with appropriate practice should enable students to learn a number of highly useful generalizations which can be applied to many other words. More time and especially more efficient and specific instruction should be devoted to the spelling needs of junior high and high school students.

Word forms. Special instruction should be provided to those students who have not mastered the ability to select the correct form of a word in a sentence. The study of word forms should occur in a vocabulary context in such a way as to provide students experience in manipulating words in a variety of ways.

Language choices. Intermediate and secondary students should have more experience and more focussed instruction in a number of dimensions which relate to effective language choices in writing. These factors include the degree of specificity of a word (see Example S) and the emotional tone conveyed by a given word in a particular context (see Example R). The

Reading Assessment Advisory Committee, which found that many twelfth grade students displayed confusion on some of the reading questions requiring them to detect the author's emotion or attitude in a selection, concurred that students need more focussed instruction in the language choices skill area.

Paragraphs. Specific and sequential instruction in a variety of paragraphs skills (including stating ideas in a logical sequence, using transitions, and achieving consistency of verb tense and pronoun reference) is needed at the secondary level. Such instruction in the paragraph skills should be reinforced by the detailed examination and discussion of written material through sustained classroom discussions. Members of the Reading Assessment Advisory Committee concurred with the English Language Assessment Advisory Committee in feeling that the intensive study of paragraphs skills is likely to increase reading comprehension as well as improve coherence in student writing.

Written Expression Results for Grade Six

Test Scope

The written expression section of the Survey of Basic Skills: Grade 6 consists of 128 questions. The items were selected to assess the students' achievement of a broad array of objectives compiled by the English Language Assessment Advisory Committee and published in Test Content Specifications for the Survey of Basic Skills: Written Expression and Spelling, Grades Six and Twelve (Sacramento: California State Department of Education, 1975). Both the objectives and the items used to assess the objectives fell into one of seven major skill areas: word forms, language choices, standard usage, sentence recognition, sentence manipulation, capitalization, and punctuation. The relative degree of emphasis assigned to each of the written expression skill areas on the Survey of Basic Skills: Grade 6 is presented graphically in Figure 8.

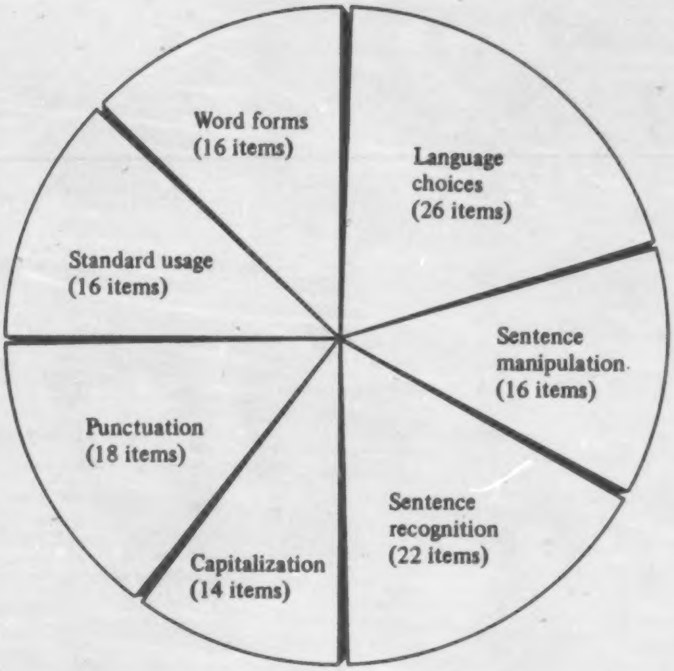


Fig. 8. Number of questions, by skill area, in the written expression section of the *Survey of Basic Skills, Grade 6*

There are also 64 spelling questions on the Survey of Basic Skills: Grade 6. Of these, 35 items tested pupils' spelling knowledge of both predictably spelled words and spelling demons; the other 29 items tested pupils' knowledge of common spelling patterns used in word forming when suffixes and prefixes are added to words.

Written Expression Scores for Grade 6

The results of sixth grade performance on the total written expression test and in each of the skill areas for 1975-76, 1976-77, 1977-78, and 1978-79 are presented in Table 5. Year-to-year changes in overall performance and in skill area performance are also shown in the table.

Table 5

Written Expression Scores of California Sixth Grade Students on the Survey of Basic Skills: Grade 6, 1975-76 through 1978-79

Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
WRITTEN EXPRESSION, TOTAL	128	62.5	63.6	64.1	64.6	+1.1	+0.5	+0.5
Word forms	16	82.4	82.3	82.9	83.0	-0.1	+0.6	+0.1
Standard usage	16	75.3	75.3	75.8	75.9	-0-	+0.5	+0.1
Language choices	26	54.4	56.5	55.2	55.7	+2.1	-1.3	+0.5
Sentence recognition	22	62.3	63.0	63.7	64.4	+0.7	+0.7	+0.7
Sentence manipulation	16	61.7	62.6	63.1	63.8	+0.9	+0.5	+0.7
Capitalization	14	57.4	58.4	59.8	61.0	+1.0	+1.4	+1.2
Punctuation	18	52.4	52.5	54.4	55.1	+0.1	+1.9	+0.7
SPELLING, TOTAL	64	63.6	63.6	64.1	64.5	-0-	+0.5	+0.4
Relationships	35	58.1	58.1	58.6	59.1	-0-	+0.5	+0.5
Word forms	29	70.2	70.3	70.8	71.0	+0.1	+0.5	+0.2

The following conclusions are apparent from an examination of the data in Table 5:

- For the third consecutive year, sixth grade performance in written expression improved. Since 1975-76, when the Survey was first administered, the average percent correct score has increased from 62.5 to 64.6, yielding an overall gain of 2.1 percent correct.
- From 1977-78 to 1978-79, gains were made in all skill areas. The skill area registering the largest increase during this time span was capitalization. Capitalization is also the skill area which has most consistently registered sizable year-to-year gains, yielding the largest overall increase (3.6 percent correct since 1975-76) for any of the skill areas in the sixth-grade written expression results.

Analysis and Interpretation of Skill Area Results, Grade Six

Members of the English Language Assessment Advisory Committee analyzed, interpreted, and evaluated the 1978-79 written expression results, as they have done in previous years. In judging the adequacy of student performance, they considered such factors as the inherent difficulty of the skills, the particular items that were used to measure each skill, and changes in performance since 1975-76. Guided by an understanding of the kinds of errors students are making, the committee concluded their analysis with recommendations for instruction.

Spelling. The 64 spelling questions on the Survey of Basic Skills: Grade 6 were designed to assess students' knowledge of regularly spelled words, spelling demons, and words formed by the addition of prefixes or suffixes. The following example is a typical spelling item from the Survey.

Example A

Fill in the oval next to the MISSPELLED word in each group. If there is no misspelled word, the answer is "All correct."

(1) ○ clean
(66) ● breaze
(2) ○ please
(31) ○ All correct

In their analysis of the spelling results, members of the committee were disturbed by percent correct scores on a number of test words involving the addition of a suffix to a base word, as in the following examples:

Example B

Pairs of words are given below. In each pair, one word is spelled correctly, and the other is spelled incorrectly. Fill in the oval next to the CORRECT SPELLING.

(20) ○ forgeting

(80) ● forgetting

Example C

(36) ○ careing
(64) ● caring

The committee judged that the scores on these and similar items were unnecessarily low since each of these words illustrates a highly regular and predictable generalization about how a word is spelled when a suffix is attached to it. The members concluded that spelling should be taught in a systematic and structured way (preferably through the use of a spelling text) so that students are exposed to clusters of words which follow a particular spelling pattern (rather than merely exposing children to a list of regular and irregular words in every lesson). In this way students are more likely to internalize spelling generalizations that apply to large groups of words. The committee added that if students fail to master some of the basic spelling generalizations related to suffixes in the third and fourth grades, where they are first introduced, these lessons should be retaught, reviewed, and practiced in the fifth and sixth grades.

Punctuation and capitalization. The 18 punctuation items on the Survey of Basic Skills: Grade 6 required pupils to identify errors in the common uses of the period, question mark, exclamation point, comma, apostrophe, and quotation marks.

While punctuation remained the most difficult skill area on the sixth grade written expression test, with an average percent correct score of 55.1, it also shows one of the largest overall gains from 1975-76 to 1978-79 (2.7 percent correct). The following example is an illustration of both the upward trend over the years and the average performance in this skill area. The set of scores accompanying the example refers to this one item only.

Example D

The following sentences may have a mistake in punctuation (periods, commas, apostrophes, etc.). When you find a mistake, fill in the oval next to the line with the mistake. If there is no mistake, fill in the fourth oval.

(6) ○ This summer we are
(55) ● going to Hollywood California
(3) ○ for at least three days.
(36) ○ (No mistakes)

Percent Correct	
1975-76	48.3
1976-77	51.7
1977-78	54.2
1978-79	54.8

The 14 capitalization questions on the Survey required pupils to recognize the parts of a sentence containing words needing capitalization. While members of the committee were pleased to see the considerable gains made by sixth graders in capitalization, they judged that scores were still too low on questions involving days of the week and months of the year. The committee expected the vast majority of sixth graders to recognize that a day of the week should be capitalized; however, only about 65 percent of the pupils did so on the following question and others like it:

Example E

In the following sentence you are to look for mistakes in capitalization. When you find a mistake, fill in the oval next to the line with the mistake. If there is no mistake, fill in the fourth oval.

(66) ● On monday my
(4) ○ brother always rides
(4) ○ his bicycle to school.
(26) ○ (No mistakes)

Members of the committee also observed that many sixth graders capitalized only the first word of a proper noun involving more than one word, a fact which suggests that a large number of students need a better grasp of the concept of a proper noun.

Word forms, standard usage, and language choices. The 16 word form questions on the Survey required students to select the correct form of a word for a blank in a given sentence. This skill area continued to be the easiest one on the test, with an average percent correct score of 83.0. The following word form question illustrates the typically high performance in this skill area:

Example F

Fill in the oval next to the word or words that best fit each sentence.

The flag was still ______ over Fort Ross.

(2) ○ wave
(6) ○ waves
(91) ● waving
(1) ○ had waved

One can see by comparing Example F with Examples B and C that while most pupils can select the correct form of a word for a sentence, fewer pupils can spell the new form of the word correctly. Thus, it appears that in most cases, the chief difficulty for students in adding suffixes to words lies in spelling the new form of the word rather than in using it.

The 16 standard usage questions on the Survey required students to select the form of a verb or a pronoun that is considered correct according to standard English usage. A majority of students continued to respond correctly to questions of this type, such as the following example:

Example G

Fill in the oval next to the choice that is correct for each sentence.

The doctors______everything possible.

(83) ● did
(17) ○ done

While members of the committee were quite pleased with the scores and progress shown in the areas of word forms and standard usage questions, they were somewhat concerned about the uneven performance in the skill area of language choices. The language choices area is designed to test students' skill in making careful word choices for different purposes. For example, some questions required students to select the most specific and vivid word for a sentence, while other questions required students to select a word reflecting a particular emotional tone in a given context. Examples of both kinds of language choice items follow.

Example H

Pretend that you are writing a story. Fill in the oval next to the word or words that will give your reader the clearest, most specific and concrete picture.

EXAMPLE:

At the bottom of her lunch sack she found _______.

0 some food
● a carrot
0 a snack
0 a vegetable

I could smell ______ cooking.

(64) ● bacon and eggs
(10) ○ a hot meal
(10) ○ some good food
(16) ○ breakfast

Example I

Fill in the oval next to the word or group of words that answers the question.

Which of the following best shows that John's attitude was unfriendly?

"Where are my bat and ball?" _______ John.

(7) ○ called
(20) ○ said
(58) ● grumbled
(15) ○ exclaimed

While members of the committee were pleased to see the gain in this area from 1977-78 to 1978-79, they still expressed concern about the uneven performance on such questions, because understanding the special effects created by word choices in written English is an important writing and reading skill.

The committee members recommended focussed instruction that would require students to make word choices according to degrees of specificity and particular emotional effects. They also suggested that teachers might construct some practice exercises parallel to the sample items shown in the interpretive supplements and Test Content Specifications as one possible strategy for providing students with such skill-building practice to be later applied in writing assignments. As is stated in the English Language Framework[1], "Practice in making the best word choice for precision and clarity should be regarded as important to each writing experience."

Sentence recognition and sentence manipulation. The 22 sentence recognition questions required pupils to identify complete sentences, incomplete sentences, run-together sentences, and sentences in normal English word order. The committee was pleased to see the consistent progress shown by sixth graders in sentence recognition. Example J is a typical sentence recognition item. The data reflect both average performance in this skill area and the upward trend registered for sentence recognition since 1975-76.

Example J

Fill in the oval next to the group of words which needs more words to make it a complete sentence.

(11) ○ They brought a present.
(18) ○ We are happy.
(8) ○ Barry is not here.
(63) ● In the dark of the night.

Percent Correct	
1975-76	58.7
1976-77	61.1
1977-78	62.2
1978-79	63.0

A close examination of Exampl[illegible] suggests that many pupils relied more heavily upon the length and sound of a word cluster than upon its structure in determining the completeness of a sentence. The committee was not discouraged by this, however, since an emphasis on grammatical structure is often delayed until junior high school.

Most of the 16 sentence manipulation questions required pupils to select the most effective sentence or sentence element, a skill that involves recognizing the most concise and direct way of expressing a statement. The following example is illustrative:

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[1] English Language Framework for California Public Schools. Sacramento: California State Department of Education, 1976, p. 45.

Example K

Beneath each sentence you will find four ways of writing the underlined part. Choose the answer that would make the best sentence, and fill in the oval next to it. The first answer is always the same as the underlined part and is sometimes the correct answer.

Besides selling candy, flowers and greeting cards are also sold by Mr. Grog.

(15) ○ Besides selling candy, flowers and greeting cards are also sold by Mr. Grog.
(24) ○ Not only candy, but Mr. Grog sells flowers and greeting cards too.
(7) ○ Candy as well as flowers and greeting cards, too, all of these are sold by Mr. Grog.
(54) ● Mr. Grog sells not only candy, but flowers and greeting cards as well.

Since this and other questions in the sentence manipulation category tend to be relatively subtle and sophisticated for sixth graders, members of the committee were pleased that performance was this high and that slight increases were again shown for sentence manipulation as a whole.

Summary of Committee's Findings and Recommendations

Members of the English Language Assessment Advisory Committee were gratified to see a third year of increasing sixth grade written expression scores. While they were pleased to see the progress made in all skill areas, the committee members confirmed the following pattern of strengths and weaknesses, which they pointed out last year.

- A majority of sixth graders can handle basic written expression skills such as the following: (1) selecting the correct form of a word for a sentence, (2) selecting the form of a verb or pronoun considered correct according to standard English usage; and (3) discriminating between complete and incomplete sentences.

- Weaknesses continued to occur in the following skill areas (even though slight gains were registered in each of them): (1) spelling words with suffixes; (2) capitalizing the days of the week and months of the year; (3) identifying the most specific or general word in a group of words; and (4) selecting a word which is most likely to convey a particular emotion.

These strengths and weaknesses are presented in Figure 9.

Figure 9

Committee Judgments of Sixth Grade Skill Area Results

Area of strength	Area in need of improvement
Selecting the correct form of a word for a sentence (Example F)	Spelling words with suffixes (examples B and C)
Selecting the correct verb or pronoun according to standard English usage (Example G)	Capitalizing the days of the week and months of the year (Example E)
Discriminating between complete and incomplete sentences (Example J)	Identifying the most specific or general word in a group of words (Example H)
	Selecting a word which is most likely to convey a particular feeling or attitude (Example I)

Guided by an understanding of sixth graders' strengths, weaknesses, and most frequent mistakes, members of the committee offered the following instructional recommendations:

1. A more efficient approach to teaching spelling is needed at the elementary level. Children should be exposed to homogeneous groups of words following similar spelling patterns so that they can more easily internalize generalizations that apply to many other words as well. Such instruction should include more emphasis in the generalizations pertaining to the spelling of words with suffixes. If students fail to form such basic generalizations in the third and fourth grades, where they are first introduced, these lessons should be retaught, reviewed, and practiced in the fifth and sixth grades.

2. Some of the simplest capitalization rules pertaining to days of the week and months of the year need to be retaught and reinforced in the fourth, fifth, and sixth grades. Intermediate students also need more specific instruction in the skill of identifying all the words in a multiple-word proper noun and recognizing that all of them must be capitalized.

3. Focussed instruction and skill-building practice are needed in the language choices skill area to help pupils understand some of the issues related to effective word choices. Such instruction should encourage students to think about word choices in terms of degrees of specificity and particular emotional effects. For example, students should recognize that "Pinto" communicates with greater precision than "car" and that "grumbled" and "stated" convey different emotions. Pupils need this sensitivity to language if they are to write effectively, read critically, and be alert to propaganda devices in all the media.

Written Expression Results for Grade Twelve

Test Scope

The written expression section of the Survey of Basic Skills: Grade 12 consists of 142 questions. The items were selected to assess the students' attainment of a wide variety of objectives compiled by the English Language Assessment Advisory Committee and published in Test Content Specifications for the Survey of Basic Skills: Written Expression and Spelling, Grades Six and Twelve. Both the objectives and the items used to assess the achievement of the objectives fell into one of six major skill areas: word forms, language choices, sentence recognition, sentence manipulation, paragraphs, and capitalization and punctuation. The emphasis placed on each of the written expression skill areas in the Survey of Basic Skills: Grade 12 is shown in Figure 10.

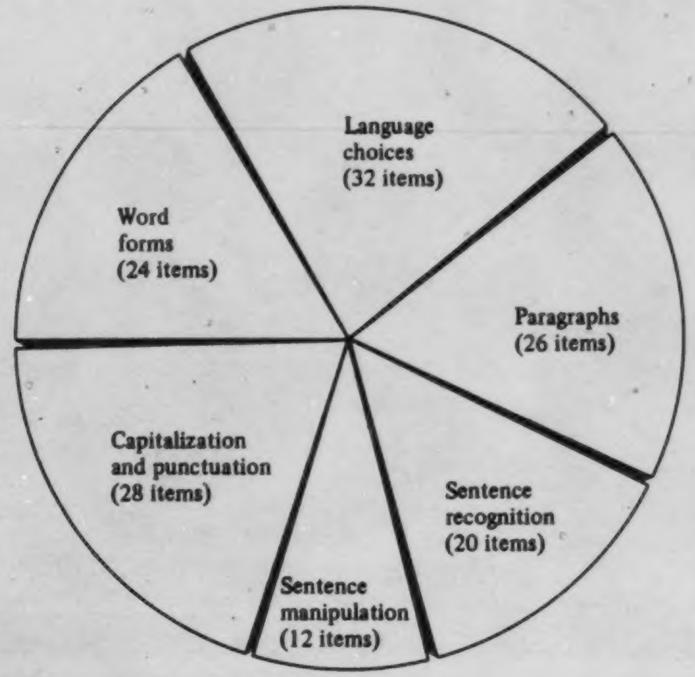


Fig. 10. Number of questions, by skill area, in the written expression section of the *Survey of Basic Skills: Grade 12*

There are also 72 spelling questions on the Survey of Basic Skills: Grade 12. These items tested students' knowledge of predictably spelled words, spelling demons, and words with prefixes and suffixes.

Written Expression Scores for Grade Twelve

The results of twelfth grade performance on the total written expression test and in each of the skill areas for 1975-76, 1976-77, 1977-78, and 1978-79 are presented in Table 6. Year-to-year changes in overall performance and in skill performance are also shown in the table.

Table 6

Written Expression Scores of California Twelfth Grade Students on the Survey of Basic Skills: Grade 12

Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
WRITTEN EXPRESSION, TOTAL	142	62.3	61.9	62.1	62.4	-0.4	+0.2	+0.3
Word forms	24	72.6	72.1	72.1	71.9	-0.5	-0-	-0.2
Language choices	32	66.9	66.7	66.6	66.6	-0.2	-0.1	-0-
Sentence recognition	20	67.3	67.7	68.4	68.8	+0.4	+0.7	+0.4
Sentence manipulation	12	42.9	42.9	43.4	43.7	-0-	+0.5	+0.3
Paragraphs	26	59.9	59.1	59.3	59.7	-0.8	+0.2	+0.4
Capitalization and punctuation	28	54.6	54.3	54.7	55.4	-0.3	+0.4	+0.7
SPELLING, TOTAL	72	68.0	67.9	68.4	68.4	-0.1	+0.5	-0-

The following observations about changes in performance are apparent from an examination of the results in Table 6:

- Twelfth grade performance in written expression improved slightly (0.3 percent) from 1977-78 to 1978-79. This gain (0.3) when added to the gain of the previous year (0.2) offset the loss which appeared after the first year of testing (0.4 percent correct), thus yielding an overall gain of 0.1 percent correct from 1975-76 to 1978-79.

- From 1977-78 to 1978-79, gains were registered in all skill areas with the exception of word forms, which suffered a slight decline (0.2 percent) and language choices which remained stable. The largest gain over this time period was in the area of capitalization and punctuation (0.7 percent). Sentence recognition is the only skill area which has consistently shown positive year-to-year gains since 1975-76, yielding an overall increase of 1.5 percent correct since the test was first administered.

Analysis and Interpretation of Skill Area Results

The 1978-79 written expression results for grade twelve were reviewed, interpreted and evaluated by the English Language Assessment Advisory Committee as were the sixth-grade results. In their analysis of the results, the committee members considered the inherent difficulty of the skills, the particular items that were used to measure each skill, and changes in performance since 1975-76. Guided by an understanding of the difficulties students were having, the committee concluded their analysis with a number of instructional recommendations.

Spelling. The 72 questions in the spelling section were designed to measure students' knowledge of the spelling of regularly spelled words, spelling demons, and words with suffixes. The average percent correct score for this category remained 68.4 for 1978-79. The following item illustrates a typical spelling item on the grade twelve *Survey*.

Example L

In each of the following sentences, one word is underlined and is written in **BOLD TYPE**. Fill in the oval next to "right" if the word is spelled correctly or next to "wrong" if the word is spelled incorrectly.

What did you do on the **Forth** of July?

○ Right (26)

● Wrong (74)

Members of the committee observed the same kind of spelling problem in the twelfth grade results as they had reported in those for the sixth grade, namely difficulties with the spelling of a word once a suffix had been attached. The following items illustrate this difficulty:

Example M

He discoverd a new method of communication.

○ Right (56) ● Wrong (44)

Example N

Our school offers a course in creative writting.

○ Right (38) ● Wrong (62)

Members of the committee were disturbed to see that so many twelfth graders had failed to learn some of the most basic rules for adding suffixes to words (see examples M and N). They were particularly surprised to see that over half of the students indicated that "discoverd" was correctly spelled.

On the basis of these and similar data, the committee recommended a skill maintenance program in spelling for junior high and high school students. Such a program might well employ a highly structured approach to spelling instruction which would introduce words grouped according to spelling generalizations, particularly generalizations which apply to the formation of new words when suffixes are attached to a base word. This kind of structure coupled with appropriate practice should enable students to learn a number of highly useful generalizations which can be applied to many other words. The committee members added that a new spelling series with heavy emphasis on these basic word-forming generalizations is needed at the junior high level. Thus, more time and especially more efficient and specific instruction should be devoted to the spelling needs of junior high and high school students.

Punctuation and capitalization. Punctuation and capitalization continued to be the second most difficult written expression skill area for twelfth graders on the Survey as the average percent correct score of 55.4 in Table 6 reflects. Scores for this skill area registered a gain of 0.7 percent correct from 1977-78 to 1978-79. The scores on the individual questions varied considerably. The following question is an example of an item on which about three-fourths of the seniors responded correctly:

Example O

In the following sentence which punctuation is needed?

We visited Taliesen West Frank Lloyd Wright's famous home in the desert.

(76) ● West, Frank
(15) ○ visited, Taliesen
(2) ○ famous, home
(7) ○ home, in

Members of the committee have observed that many more students performed successfully on questions where punctuation coincided with the natural junctures of spoken English as in Example O. However, where students had to use knowledge of a convention as a guide, the percent correct scores dropped substantially as is illustrated in the following example:

Example P

In each sentence there may be an error in capitalization or punctuation. The error, if any, is underlined and lettered. If there is an error, select the one underlined part that must be changed to make the sentence correct. If there is no error, the answer is D.

"Mice, as well as other pets, need some peace

and quiet, but they should'nt be left entirely
A B

alone," advised Dr. Crane, the veterinarian.
C

No error
D

○A	●B	○C	○D
(9)	(61)	(10)	(20)

The scores on this question also illustrate the difficulty which students evidently have at all grade levels with apostrophe usage--in both contractions and possessives.

Word forms and language choices. Most of the 24 word form questions on the Survey required students to select the correct form of a word for a sentence and to demonstrate a variety of dictionary skills for different purposes. As a whole this category continued to be the easiest one for twelfth graders; however, it was also the only skill area registering a decline (by 0.7 percent correct) since 1975-76. The following item illustrates both the typically high scores for word forms and the overall decline since 1975-76:

Example Q

Select the form of the word which best completes the following sentence.

The girl did her work very ________.

(1) ○ cheerfulness (8) ○ cheerful
(91) ● cheerfully (0) ○ cheer

Percent Correct	
1975-76	95%
1976-77	92%
1977-78	92%
1978-79	91%

Some members of the advisory committee remarked that almost all twelfth graders should have mastered items like Example Q and, therefore, expressed concern over any slippage in this important skill area. The committee concluded that teachers should not overlook teaching the related forms of words. They recommended that such language study occur in a context so students gain experience at manipulating words in a variety of ways.

The 32 language choice questions required students to identify attitude-conveying words and phrases, to differentiate between specific and general words, and to identify the intended audience of a piece of writing. Language choices is the one written expression skill area on the Survey that has shown a decline for two years in a row. Like scores on word forms, scores on language choices declined for two out of three years. There was no change in performance for this skill area from 1977-78 to 1978-79. The following are examples of two kinds of skills assessed by the language choice questions:

Example R

Dr. Henry J. Heimlich, _____ at Jewish Hospital in Cincinnati, described the technique in the journal *Emergency Medicine* and invited physicians to try it in real emergencies.

Which of the following terms is most respectful in the context of the above sentence?

(62) ● director of surgery
(1) ○ chief blade
(17) ○ practitioner
(20) ○ head doctor

Example S

Which of the following words or groups of words is most SPECIFIC?

(34) ○ current events magazine
(5) ○ publication
(55) ● *Newsweek*
(6) ○ magazine

The committee members expressed concern over the continuing low level of performance on questions like the one shown as Example S. This kind of skill is one of considerable interest to the committee since student writing typically suffers from a lack of specificity. Such generality and vagueness in student writing may result from the fact that many students cannot even recognize the most specific word in a list.

As is stated in the English Language Framework:[1] "Students should recognize varying degrees of abstraction in words as well as degrees of generality in words by being exposed to continued experience in understanding that a word like car is more general than Pinto, and that abstract words like love, honor, and truth are emotion-arousing, highly abstract, and general; therefore, meaning different things to different people."

The committee recommended more focussed instruction in language choices to supplement instruction in this area. Such focussed instruction should require students to make careful word choices based upon such factors as the degree of specificity and the emotion conveyed by a particular word (as, for example, by developing exercises parallel to the language choice questions in the Test Content Specifications).

Sentence recognition and sentence manipulation. The 20 sentence recognition questions required students to identify complete sentences, sentence parts, sentence patterns, and the appropriate subject-verb relationship.

Sentence recognition continues to be the second easiest written expression skill area on the Survey for twelfth graders, and it is the only skill area to have registered an increase for three years in a row (0.4, 0.7, and 0.4 percent correct). These increases may reflect a renewed focus on the sentence in the return to the basics. However, twelfth grade scores still varied greatly in the sentence recognition skills, depending on the complexity of the questions being asked. For example, over two-thirds of the students were able to identify the incomplete sentence in the following question:

---

[1] English Language Framework, p. 48.

Example T

Identify the group of words which is incomplete or needs additional words to complete the meaning.

(70) ● The barking dog in the driveway.
(6) ○ It is humid.
(19) ○ Peace continues.
(5) ○ There is the mail.

The error pattern for Example T suggests that many students relied more heavily upon the length of a word group than upon its structural components in determining the completeness of a sentence. The responses to the next example also indicate that over one-third of the twelfth graders are, indeed, confused about some of the basic grammatical elements of a sentence.

Example U

The ______ man seems very ______.

The part of speech that will usually fill both blanks in the sentence above is:

(11) ○ a noun (64) ● an adjective
(18) ○ a verb (7) ○ a pronoun

Many twelfth grade students failed to demonstrate the ability to discriminate between effective and ineffective sentence style. Students continued to prefer awkward, wordy, and choppy sentences to direct, concise statements. The following example is an illustration of this difficulty:

Example V

Beneath the following sentence you will find four ways of writing the underlined part. Choose the answer that makes the best sentence, and make the oval in front of the answer you have chosen. The first answer is the same as the underlined part and may be the correct answer.

On Sunday we bathed the dog, which he needed very badly.

(39) ○bathed the dog, which he needed very badly
(5) ○bathed the dog, which he very badly had need of
(50) ●gave the dog a badly needed bath
(6) ○gave the dog a bath, being badly needed

As members of the committee have observed in previous years, high school seniors do not equate effective writing with conciseness.

Paragraphs. The 26 paragraph questions on the Survey required students to identify irrelevant sentences, recognize inconsistent verb tenses, determine logical sequences, select summary statements, and identify transitional words within one or more paragraphs.

Although scores on the paragraph section improved for a second year, twelfth graders still failed to compensate completely for the decrease of 0.8 percent correct in paragraph skills scores registered from 1975-76 to 1976-77. Members of the committee expressed concern about any decline on these questions, which assess students' understanding of the relationships between sentences and paragraphs.

The following questions, based on the same paragraph, are illustrative:

Example W

The seven sentences below are in a scrambled order. Some of them can be put together to make a single, unified paragraph. Before attempting to answer any questions, read all of the sentences carefully.

A 1 It probably received its name from its
2 copper-colored head which is triangular
3 in shape.
B 4 Like the rattlesnake, it is a member of
5 the pit viper family having a hollow or
6 pit between the eye and the nostril.
C 7 The copperhead was once the most common
8 and widely distributed of all venomous
9 snakes in the United States.
D 10 This may be the reason that Democrats in
11 the North who sympathized with the South
12 in the Civil War were called "copperheads,"
13 for they were suspected of treachery.

E 14 Unlike the rattlesnake, it has no rattles
15 and strikes without warning.
F 16 Augustus Thomas wrote a full-length drama
17 that he called *The Copperhead.*
G 18 Today, however, it is most frequently
19 found in sparsely settled areas of the
20 South.

Which sentence most logically follows Sentence C?

(18) ○Sentence A (14) ○Sentence E
(10) ○Sentence B (58) ●Sentence G

Example X

Which of the following words serves as a transitional word in the paragraph?

(15) ○which (line 2) ○copperhead (line 7) (17)
(12) ○rattlesnake (line 4) ●however (line 18) (56)

Members of the committee speculated that a weak grasp of sequence and transitional elements in paragraphs (illustrated by examples W and X) may be related to the loss of coherence reported by the National Assessment of Educational Progress in its most recent study of the writing of seventeen-year-olds. Of equal concern to the committee was the confusion displayed by many students when asked to identify the sentence in a paragraph containing a verb with an inconsistent tense, as in the following example:

Example Y

WASHINGTON (UPI)—(1) Director William E. Colby admitted Tuesday the CIA kept a secret cache of deadly poisons and forbidden weapons—including a suicide drug for captured U.S. spies—despite Presidential orders to destroy them in 1970.

(2) Later, Dr. Frank Gordon, a retired CIA scientist, identifies himself and two colleagues as the agency officials who secreted the most potent of the banned poisons in a vault where it remained hidden for five years.

(3) Gordon was questioned for hours by the Senate Intelligence Committee. (4) He said his group decided the White House directive did not apply to the CIA supply of deadly shellfish toxins because they were chemical, not biological, and because he thought the directive was meant only for the Army.

(5) In his testimony, Colby produced a black electric dart gun, slightly larger than a .45-caliber pistol, and explained it could fire poison-tipped darts 100 yards and kill a person silently and instantly at that range.

(6) Colby also said the secret cache of poisons made from cobra venom and shellfish toxins could be used in offensive weapons such as the dart gun or in new, improved suicide pills for U.S. spies.

Which sentence is inconsistent with the time development?

(21) ○ Sentence 1 ○ Sentence 3 (27)
(35) ● Sentence 2 ○ Sentence 4 (17)

Members of the committee concluded that the weak performance on this kind of task reveals an inadequate grasp of time development as it relates to consistency of verb tense in paragraph construction.

Related to this difficulty is the one of establishing consistency of person in a sentence or paragraph. In the following test item, over half of the twelfth graders failed to detect the inconsistency between a pronoun and its referent:

Example Z

In each sentence there may be an error. If there is an error, decide which underlined part must be changed to make the sentence correct. Mark the oval corresponding to the letter for the underlined part.

Many of Shakespeare's plays appear to question
A
whether it is within the power of man to
B
control your own destiny. No error
C D

○ A	○ B	● C	○ D
(11)	(14)	(44)	(31)

The low score on this question may reflect the more basic difficulty of recognizing the referent of a given pronoun in the first place. In this case "man" is the referent of the incorrect "your." Such difficulties with pronoun reference were noted by the Reading Assessment Advisory Committee in their analysis of the reading results at all grade levels.

Summary of the Committee's Conclusions and Recommendations

Members of the committee were pleased to see the slight overall improvement shown by twelfth graders in written expression from 1976-77 to 1977-78. They were happy to see what appears to be the beginning of an upward trend in written expression achievement for high school seniors. In their examination of the results, the committee discerned a pattern of strengths and weaknesses, which is highlighted as follows:

- Most California high school seniors demonstrated an ability to handle some fundamental writing skills tested on the Survey of Basic Skills: Grade 12, such as the following:
    1. Selecting the correct form of a word in a sentence
    2. Differentiating between complete and incomplete sentences
    3. Inserting needed punctuation in sentences in which the natural junctures of spoken English could be used as a guide
- Too many twelfth graders are showing unexpected confusion over the rudimentary skill of spelling words correctly when suffixes are attached.
- Twelfth graders are also less adept at some of the more demanding language skills, such as:
    1. Using appropriate punctuation in sentences where the student must be guided by knowledge of a rule or convention rather than by the sound of spoken English

2. Recognizing the most specific or general word in a group of words
3. Selecting a word which is most likely to convey a given attitude or emotion
4. Identifying a particular grammatical element in a sentence
5. Recognizing the most effective and concise statement of an idea

- The uneven performance on paragraph skills is of particular concern to the committee since the ability to handle these skills is so closely related to coherence. Significantly, in its latest report on writing, the National Assessment of Educational Progress reported a decline in coherence in the writing of seventeen-year-olds throughout the nation.

Figure 11

Committee Judgments of Twelfth Grade Skill Area Results

Area of strength	Area in need of improvement
Selecting the correct form of word for a sentence (Example Q)	Spelling words with suffixes (examples M and N)
Discriminating between complete and incomplete sentences (Example T)	Inserting punctuation in sentences where a knowledge of a rule or convention is necessary (Example P)
Inserting punctuation in sentences where the sound of spoken English could be used as a guide (Example O)	Recognizing the most specific or general word in a group of words (Example S)
	Selecting a word which is most likely to convey a particular attitude or emotion (Example R)
	Identifying basic grammatical elements in sentences (Example U)
	Recognizing the most effective and concise statement of an idea (Example V)
	Achieving coherence in paragraphs (examples W, X, Y, and Z)

Guided by an understanding of the difficulties students were having, the English Language Assessment Advisory Committee offered the following recommendations for teaching:

Spelling. A skill maintenance program in spelling for junior high and high school students is needed. Such a program should involve a highly structured approach to spelling instruction which would introduce words grouped according to spelling generalizations, particularly generalizations which apply to the formation of new words by the addition of suffixes to a base word. This kind of structure coupled with appropriate practice should enable students to learn a number of highly useful generalizations which can be applied to many other words. More time and especially more efficient and specific instruction should be devoted to the spelling needs of junior high and high school students.

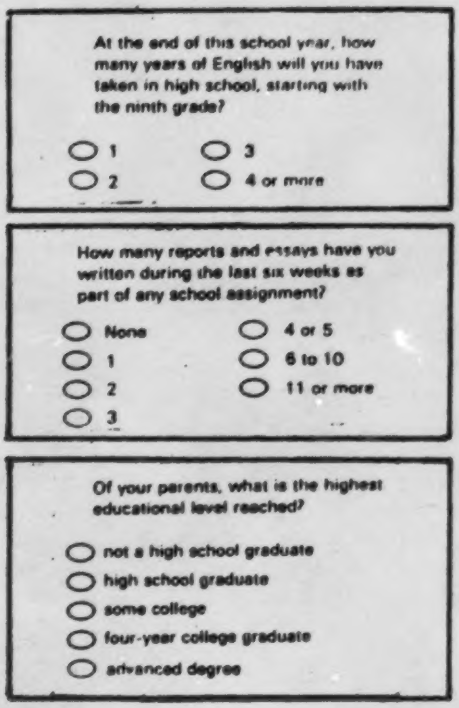
Word forms. Special instruction should be provided to those students who have not mastered the ability to select the correct form of a word in a sentence. The study of word forms should occur in a vocabulary context in such a way as to provide students experience at manipulating words in a variety of ways.

Language choices. Intermediate and secondary students should have more experience and more focussed instruction in a number of dimensions which relate to effective language choices in writing. These factors include the degree of specificity of a word (see Example S) and the emotional tone conveyed by a given word in a particular context (see Example R). The Reading Assessment Advisory Committee, which found that many twelfth grade students displayed confusion on some of the reading questions requiring them to detect the author's emotion or attitude in a selection, concurred that students need more focussed instruction in the language choices skill area.

Paragraphs. Specific and sequential instruction in a variety of paragraphs skills (including stating ideas in a logical sequence, using transitions, and achieving consistency of verb tense and pronoun reference) is needed at the secondary level. Such instruction in the paragraph skills should be reinforced by the detailed examination and discussion of written material through sustained classroom discussions. Members of the Reading Assessment Advisory Committee concurred with the English Language Assessment Advisory Committee in feeling that the intensive study of paragraphs skills is likely to increase reading comprehension as well as improve coherence in student writing.

Further Analysis of Grade Twelve Written Expression Scores

The analysis of the twelfth grade written expression results involved three additional factors this year: (1) the number of English courses taken by the students, (2) the number of essays or reports written by students during the six-week period prior to testing, and (3) the educational level attained by the students' parents. Each student was asked to provide this information in the student information section of the test booklet. The questions appeared on the test booklets as follows:



At the end of this school year, how many years of English will you have taken in high school, starting with the ninth grade?

○ 1
○ 2
○ 3
○ 4 or more

How many reports and essays have you written during the last six weeks as part of any school assignment?

○ None
○ 1
○ 2
○ 3
○ 4 or 5
○ 6 to 10
○ 11 or more

Of your parents, what is the highest educational level reached?

○ not a high school graduate
○ high school graduate
○ some college
○ four-year college graduate
○ advanced degree

Years of English Completed

Table 7 contains the percents of twelfth grade boys and girls taking one, two, three and four or five years of English. These data reveal that 95 percent of California's twelfth graders in 1978-79 took either three or four or more years of English from the ninth through the twelfth grades;

58.0 percent took four or more years of English while 36.4 percent reported taking only three years of English. A higher percent of girls (59.3) than boys (56.7) reported taking four or more years of English from the ninth through the twelfth grades.

Information regarding statewide high school graduation requirements in English has been published annually in the October Report since 1975-76. These data suggest that an increasing number of districts are requiring more English. For example, in 1976-77, 63 districts required more than three years of high school English; in 1977-78, 84 districts required more than three. Thus, even though the majority of districts were still requiring only three years of high school English in 1977-78, there is a noticeable statewide shift towards a heavier English requirement for high school graduation. Interestingly, the University of California system reports that beginning in 1981, it will establish four years of high school English as an entrance requirement for incoming freshmen.

Written Expression Scores According to Number of Courses in English

Table 7 also contains the written expression scores of students according to the number of English courses taken. As the English Language Assessment Advisory Committee expected, a direct relationship appeared in the data between students' scores in written expression and the number of years of English students reported to have taken. For example, the highest scoring group was the one that took four years of high school English, which constituted 58.0 percent of the population. Scores declined systematically as the number of years of English decreased down to the lowest scoring group which took only one year of English. It is of course, not possible to determine the extent to which these differences are a result of the greater exposure to English instruction and how much they merely reflect basic differences in the interests, motivations, and abilities of students who elect to take differing amounts of English. It is well known that students who do well in a course are more likely to continue the sequence than those who do not.

Table 7

Percent of Twelfth Grade Students and Their Written Expression Scores by Years of English Taken

Years of English	Percentage of Students			Percent Correct Score		
	Boys	Girls	Total	Boys	Girls	Total
One	0.8%	0.5%	0.7%	45.9	45.2	45.6
Two	5.4%	4.5%	5.0%	52.6	54.8	53.5
Three	37.1%	35.7%	36.4%	58.7	61.2	59.9
Four or more	56.7%	59.3%	58.0%	63.9	66.1	65.0

Table 8

Percent of Twelfth Grade Students and Their Written Expression Scores by Years of English Taken and Parental Education

Number of Years of English Taken	Parental Education									
	No High School		High School		Some College		Four Years College		Advanced Degree	
	Percent	Score	Percent	Score	Percent	Score	Percent	Score	Percent	Score
1	1%	35.0	1%	47.3	1%	48.2	1%	45.7	1%	59.5
2	8%	45.6	7%	53.1	4%	57.1	3%	54.6	3%	61.6
3	40%	51.1	43%	56.8	38%	62.5	31%	63.5	27%	66.0
4	51%	54.2	49%	59.9	57%	65.6	65%	68.8	69%	72.7
Total	51.9		57.9		63.9		66.4		70.5	

Table 8 shows the percents of students taking one through four years of English broken out according to the educational level of their parents. The data in Table 8 show that there were students from all five educational backgrounds taking one, two, three and four or more years of English. However, there is also an observable upward shift in educational background as the number of years of English taken by students increases. That is, the more education a student's parents have, the more likely that student will take four or more years of English. For example, 51 percent of the students whose parents had not completed high school reported taking four or more years of English, whereas, 69 percent of the students whose parents had completed advanced degrees were taking four or more years of English.

Also observable from Table 8 is the very strong relationship between parental education and written expression scores. The scores for the total population, broken out by parental education, show very large and consistent increases as parental education increase, from 51.9 percent correct for students whose parents did not complete high school to 70.5 for the students of parents with advanced degrees. (Similar patterns are discussed for the reading and mathematics scores by parental education in Chapter VI, "Analyses of Student Achievement for Subgroups of Pupils.")

The data in Table 8 are also broken out according to the number of years of English taken. It is easy to see in the data the relationship between parental education and written expression scores, and the relationship between years of English and written expression scores. As one might expect, the students taking only one year of English whose parents did not graduate from high school were the lowest scoring group (35.0), whereas those who reported taking four or more years of English and whose parents had attained advanced degrees were the highest scoring group (72.7). Of course, the causal nature of these relationships cannot be established by the correlational data in Table 8.

It is also interesting to note that even within an educational level, the range of scores across years of English is still very wide. It is not possible to know without further information and analyses whether this should be attributed to the potency of English courses, to the wide range of socioeconomic levels of students within a given parental education category, or to the efficiency of the self or institutional screening/selection process involved in determining how many years of English a student will complete.

Table 9

Percents of Twelfth Grade Students and Their Written Expression Scores by Numbers of Reports and/or Essays Written

Reports and/or Essays Written	Percentage of Students			Percent Correct Score		
	Boys	Girls	Total	Boys	Girls	Total
0	23.4	21.2	22.3	57.0	59.1	58.1
1	14.3	15.0	14.7	59.1	61.5	60.3
2	14.8	14.1	14.4	60.4	62.6	61.5
3	13.2	13.2	13.2	61.5	64.5	63.1
4-5	17.6	18.1	17.9	64.0	66.3	65.2
6-10	11.6	13.1	12.3	66.9	69.2	68.0
11	5.1	5.3	5.2	65.6	68.0	66.8

Number of Reports and Essays Written

Table 9 shows the percent of students, broken out by sex, according to the number of reports and essays which students reported having written as part of any school assignment during the six-week period prior to the testing (which occurred in December). The largest percentage to respond to any one category were the 22 percent who reported having written no essays or reports during the six weeks prior to testing. The next largest group (17.9 percent) reported having written 4 to 5 reports or essays during the previous six weeks. Approximately equal percentages of students (14.7, 14.4, 13.2) reported writing one, two and three essays or reports respectively; 12.3 percent indicated they had written 6 to 10 reports or essays, while 5.2 percent reported having written 11 or more reports or essays.

The data also suggest that girls tend to report that they do more writing than boys. For example, a higher percentage of girls than boys reported having written four or more essays during the previous six weeks. Correspondingly, a higher percentage of boys (23.4) than girls (21.2) indicated that they had not written any reports or essays during this period.

Written expression scores according to number of reports and/or essays written. Table 9 also shows the written expression scores of students according to the number of essays written. The data generally reveal a direct relationship between the number of essays and/or reports written by students and their written expression scores. For example, those who reported writing no reports or essays during the previous six weeks obtained the lowest written expression scores, 58.1 percent correct, whereas the group which obtained the highest scores were those who reported writing six to ten reports and essays. The exception to this overall pattern occurred for the group which reported writing 11 or more essays during the previous six weeks. This group scored somewhat below the group which reported writing 6 to 10 essays or reports. One cannot safely conclude that writing essays and report is what led to the higher written expression scores because the same pattern appeared in the reading and mathematics scores.

Table 10

Percents of Twelfth Grade Students and Their Written Expression Scores by Numbers of Reports and/or Essays Written and Parental Education

Number of Essays	No High School		High School		Some College		Four Years College		Advanced Degree	
	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score
0	30	49.3	28	56.0	22	60.4	18	62.0	14	62.0
1	16	50.3	17	57.3	15	60.6	13	65.0	12	67.9
2	14	51.8	15	57.5	15	62.6	15	64.4	14	69.1
3	13	51.7	12	58.6	13	65.9	14	67.3	13	72.1
4-5	16	55.2	15	59.4	18	65.8	20	68.9	22	72.6
6-10	7	57.3	9	62.4	12	69.8	14	70.5	17	74.2
11+	4	56.9	4	58.5	5	67.4	6	69.1	8	75.3

Table 10 shows the percentages of students writing one through eleven or more reports and essays, broken out by parental education. These data show that some students from each educational level fell into each essay category. However, it is also apparent from the data that the amount of writing done at school tends to increase as parental education increases. For example, 30 percent of the students whose parents did not complete high school reported not writing any essays during the previous six-week period, whereas only 14 percent of those whose parents completed advanced degrees fell into the 0-essay category. Furthermore, the percentages of students who reported writing four or more essays increase systematically with increases in parental education.

The written expression scores of students tend to increase with (1) increases in parental education and (2) increases in numbers of reports or essays students reported having written. Both patterns are apparent from the data in Table 10. The students with the lowest written expression scores in this Table are those who reported not writing any essays or reports at school in the previous six weeks and who also indicated that the highest educational level attained by their parents was below a high school diploma. Those with the highest scores were the children of parents with advanced degrees who reported having written 11 or more essays during the previous six weeks. This is the only group in the 11-or-more-essay category which obtained higher written expression scores than the 6-to-10-essay category. Again, the causal nature of these relationships lies buried awaiting further analyses.

Furthermore, as noted when the scores were analyzed by years of English and level of parental education the range of scores across number of essays written within an educational category tends to be only slightly narrower than when parent education is not considered in the analysis. This indicates that parent education can be used to explain only a portion of the variation among scores across essay groups.

Table 11

Percent of Twelfth Grade Students and Their Written Expression Scores by Years of English and Number of Essays Written

Number of Reports or Essays Written	Years of English							
	1		2		3		4	
	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score	Percent of Students	Percent Correct Score
0	39	44.4	40	53.7	33	58.7	14	58.7
1	16	45.7	18	54.1	18	60.0	12	61.8
2	13	46.8	15	54.8	15	60.0	14	63.4
3	11	49.0	10	52.4	11	60.5	15	65.0
4-5	11	46.0	10	53.1	13	61.5	22	67.2
6-10	5	46.9	5	54.0	7	62.6	16	70.1
11	5	46.9	2	49.4	3	60.0	7	69.1

Written Expression scores by years of English and number of essays written. Table 11 shows the percents of students writing zero through 11 or more essays or reports (during the six-week period prior to testing) according to the number of years of English taken.

These data suggest that students taking four or more years of English tend to write more essays or reports than students taking three or fewer years of English. For example, 45 percent of those taking four or more years of English fell in the top three categories of essays written (7 percent plus 16 percent plus 22 percent) whereas, only 23 percent (13 plus 7 plus 3) of those taking three years of English fell into these higher-frequency-of-writing categories. The largest proportion of students taking only three years of English which fell into any one writing category were the 33 percent who reported not writing any reports or essays during the previous six week period.

Also shown in Table 11 are the written expression scores according to years of English taken and numbers of essays and/or reports written during the previous six weeks. As it has been noted previously, written expression scores tend to increase with (1) increases in number of English courses taken and (2) increases in the number of essays and/or reports written.

Both patterns are detectable in Table 11. Thus, the lowest scoring students were those taking one English course and writing zero essays while the highest scoring students were those who reported taking four or more years of English and writing six to ten essays.

V. Mathematics Achievement for Grades Six and Twelve

Synopsis of Findings and Recommendations

California's sixth grade students continued to show improvement in mathematics achievement in 1978-79. From 1977-78 to 1978-79 the overall mathematics achievement score of sixth grade students increased 0.5 points in percent correct units. This has resulted in an increase of one percentile point on a publisher's national norms (Comprehensive Tests of Basic Skills); the median score of sixth grade students now stands at the 54th percentile on that publisher's national norms. Since the introduction of the new test--Survey of Basic Skills: Grade 6--four years ago, math scores have shown steady improvement. Over the four-year period, the overall mathematics achievement of sixth graders has improved 1.6 points in percent correct units, resulting in an increase of four percentile points on the publisher's national norms.

The mathematics achievement score of California's twelfth grade students improved 0.2 points in percent correct units in 1978-79. This increase did not result in an increase of percentile points on a publisher's national norms (Iowa Tests of Educational Development); the median score of twelfth grade students remains at the 43rd percentile.

Skill Area Strengths and Weaknesses

The members of the Mathematics Assessment Advisory Committee reviewed the statewide results to determine strengths and weaknesses in the mathematics achievement of California students. While the presentations of skill area strengths and weaknesses is based on the committee's judgments, the Department of Education accepts the responsibility for the content and conclusions in this report.

Grade six. The members of the Mathematics Assessment Advisory Committee were pleased to note the continuing upward trend in the sixth grade mathematics achievement. In 1978-79 the average score of sixth grade students improved in all four major skill areas of mathematics--arithmetic, geometry, measurement and graphs, and probability and statistics. The committee observed that out of the 15 subskills contained in these skill areas, the sixth grade students showed positive increases in 13 skill areas over the 1977-78 results, a slight decline in one, and a continued significant decline in one (number properties).

In the judgment of the advisory committee, sixth grade students do very well in computing with whole numbers and simple fractions, adding and subtracting decimals, recognizing common geometric shapes, and reading simple bar graphs. The areas that the committee cited as needing improvement are dividing decimals and performing decimal applications; using formulas for perimeter, area, and volume; computing mean, median, and range; and calculating the probability of simple events.

Grade twelve. The members of the Mathematics Assessment Advisory Committee were pleased to note that the scores of twelfth grade students showed a modest upward trend in 1978-79. In examining the 1978-79 results, the committee observed that of a total of 17 subskills, the twelfth grade students showed improvement in 13 and a decline in four over the 1977-78 results. For the second year in a row twelfth grade students showed significant improvement in decimal computation.

In the judgment of the advisory committee, twelfth grade students do quite well in computing with whole numbers, performing whole number applications, solving equations in one unknown, reading line and bar graphs, recognizing common geometric terms and shapes, and computing with denominate numbers. The areas the committee cited as needing improvement are computing with mixed fractions, decimals, and percents; performing fraction and decimal applications; solving equations with two unknowns; interpreting data from tables and graphs requiring two-step analysis; comprehending geometric relationships; solving consumer-related problems; and computing mean, median, and range and calculating the probability of events.

Relative Performance of Girls and Boys

The analysis of the 1978-79 results, by sex, showed no major changes in the performance of the two groups over the analysis reported in 1977-78. Girls do consistently better than boys in computations with whole numbers, fractions, and decimals. The girls continue to outperform boys on simple one-step word problems, and the boys continue to score higher than the girls on multiple-step word problems. The committee noted that this trend cuts across all socioeconomic levels.

The committee expressed great concern over the implications of the analysis of the results, by sex. Clearly, something is happening in society in general, and/or in instructional programs in particular, that may be causing nearly half of the school population to perform at a lower level in mathematics than their counterparts of equal capability.

Committee Recommendations

The committee made the following general recommendations on the basis of their analysis of the mathematics results for grades six and twelve:

- Additional curricular emphasis should be given at all appropriate grade levels to problem solving/application skills in all major skill areas--arithmetic, algebra, geometry, measurement, and probability and statistics.

- The emphasis placed on all measurement skills should be increased.

- An effort should be made to identify the societal and school factors that may be causing the differences in mathematics performance by boys and girls; and instructional programs, counseling programs, and in-service training programs should be designed to provide maximum and equal opportunities for learning of mathematics by both girls and boys.

Mathematics Results for Grade Six

Test Scope

The Survey of Basic Skills: Grade 6 was developed specifically to assess the students' attainment of mathematics skills taught through the sixth grade level in most California schools. The 160 questions on the Survey were designed to assess students' skills in the areas of arithmetic, geometry, measurement, and probability and statistics. Figure 12 is an illustration of the emphasis placed on each skill area in the total test. In the figure the skill area of arithmetic is subdivided into number concepts, whole numbers, fractions, and decimals. The emphasis on each area in the test is consistent with the general mathematics curriculum of most California schools and the recommendations in Mathematics Framework for California Public Schools. A detailed description of the skills assessed in the Survey is given in Test Content Specifications for the Survey of Basic Skills: Mathematics, Grades Six and Twelve (Sacramento: California State Department of Education, 1975). Additional descriptions of the major skills assessed in the Survey and example test questions are included in Appendix F of this report.

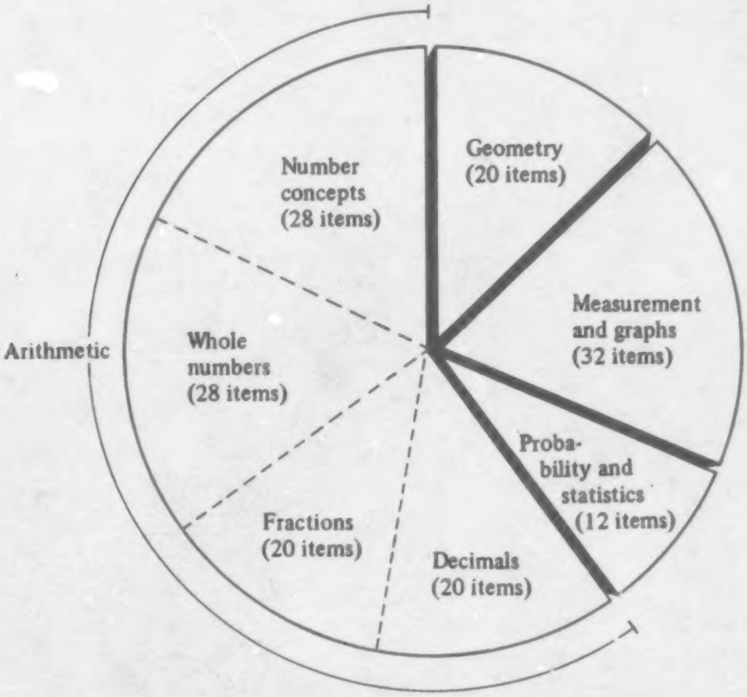


Fig. 12. Skill area emphases in the *Survey of Basic Skills: Grade 6*

Mathematics Scores for Grade Six

Table 12 contains the sixth grade Survey results for 1975-76 through 1978-79. The last three columns of the table show the changes in scores over the same period.

Table 12

Mathematics Scores of California Sixth Grade Students on the Survey of Basic Skills: Grade 6

Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
MATH, TOTAL	160	57.4	57.7	58.5	59.0	+0.3	+0.8	+0.5
Arithmetic	96	61.0	61.0	61.8	62.3	0.0	+0.8	+0.5
Number concepts	28	65.4	65.5	65.6	65.8	+0.1	+0.1	+0.2
Whole numbers	28	66.9	67.5	68.0	68.4	+0.6	+0.5	+0.4
Fractions	20	49.6	49.0	50.6	51.3	-0.6	+1.6	+0.7
Decimals	20	56.3	57.8	59.0	59.9	+1.5	+1.2	+0.9
Geometry	20	58.8	58.5	59.3	59.8	-0.3	+0.8	+0.5
Measurement and graphs	32	52.1	53.5	54.4	55.1	+1.4	+0.9	+0.7
Probability and statistics	12	40.4	40.9	41.6	41.7	+0.5	+0.7	+0.1

A more detailed breakdown of skill area results for the four year period appears in Figure 13. The following overall conclusions are apparent from the data in Table 12 and Figure 13.

- The overall mathematics scores improved consistently over the four year period.

- Over the four year period, students registered the greatest gains in the skill area of decimals in general and decimal computation in particular. The area of measurement and graphs is the area in which students showed the next greatest gains. The scores for knowledge of facts and applications of measurement also increased.

- Scores in the skill of number properties showed a continuous and significant decline over the four year period. In all skill

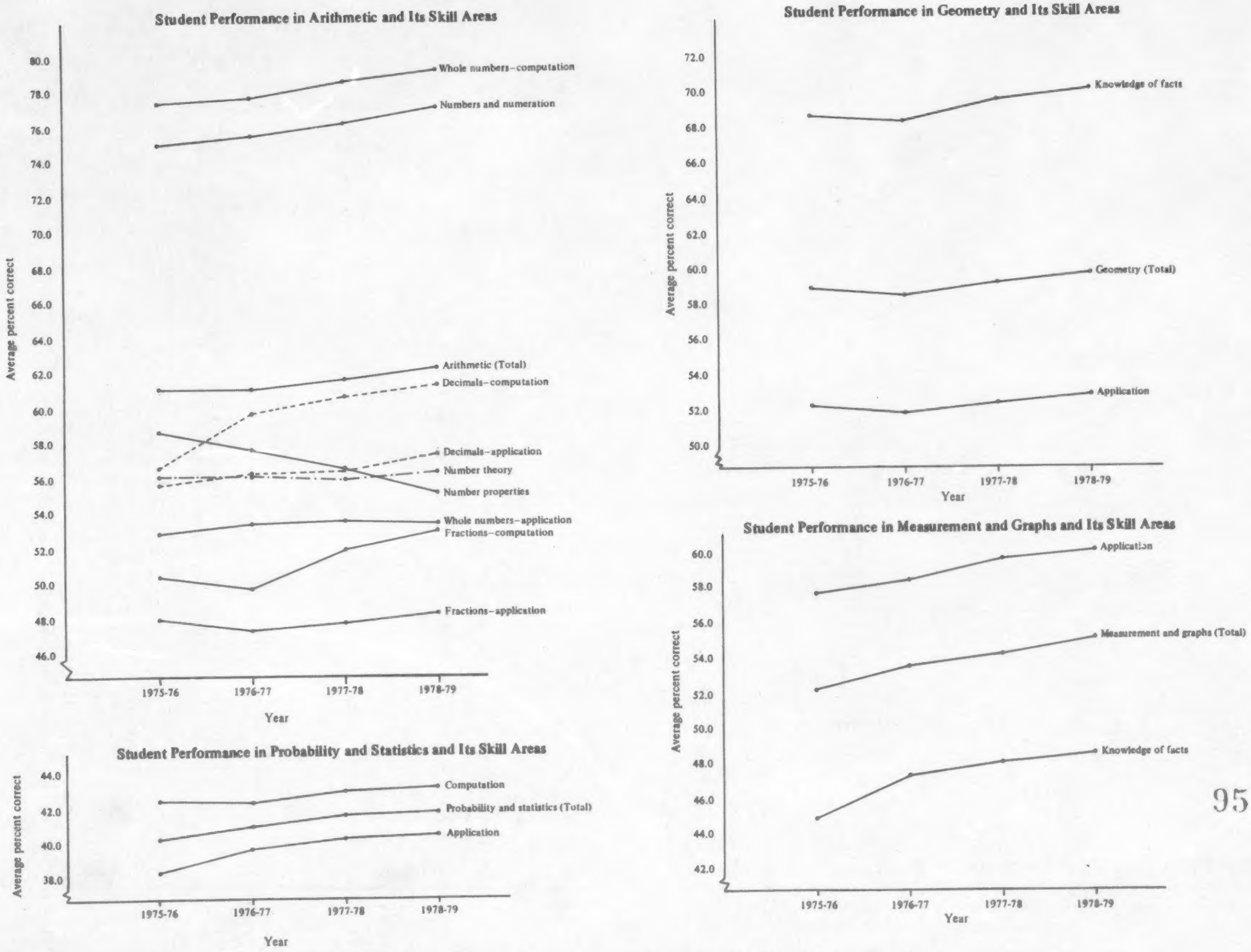


Fig. 13. Graphic representations of average mathematics scores and changes in scores on the *Survey of Basic Skills: Grade 6*, 1975-76 through 1978-79

areas except the ones mentioned above, students showed small but consistent gains over the period of four years.

Analysis and Interpretation of Skill Area Results

As in previous years, the Mathematics Assessment Advisory Committee conducted an in-depth review of the mathematics results, by skill area. The committee members judged the adequacy of student performance in light of the difficulty of the questions, the relative emphasis on each skill in a typical classroom, and changes in student performance over a period of four years.

Arithmetic. The arithmetic portion of the *Survey* consists of a total of 96 questions in four skill areas--number concepts, whole numbers, fractions, and decimals. There was an overall increase of 0.5 percent correct in arithmetic from 1977-78 to 1978-79.

In 1978-79 student performance in arithmetic showed an increase in seven skill areas, and a decrease in two (number properties had a decrease of 1.2 percent correct, and whole number applications had a decrease of 0.1 percent correct). The most dramatic increase over the last four years was in decimal computation, in which sixth grade students registered an increase of 5.0 percent correct. Correspondingly, the most dramatic decrease over the last four years was in number properties.

In the opinion of the advisory committee, the continued decline in the number properties skill is due to a decrease in the emphasis on these concepts in newly adopted textbooks and by classroom teachers. The committee members indicated a need to emphasize number properties to improve students's understanding of math concepts. Example A is illustrative of the distributive property skill that the committee believes needs more emphasis in the classroom.

Example A

Select the correct name for the missing number:

$$3 \times 26 = (3 \times \square) + (3 \times 6)$$

(19) ○ 2
(12) ○ 6
(34) ● 20
(14) ○ 26
(21) ○ None of these

Percent Correct	
1975-76	40.9
1976-77	37.8
1977-78	36.5
1978-79	33.9

In whole number computation the advisory committee judged that scores were good when the testing began in 1974-75 and that these scores have been increasing significantly each year. The committee also noted that although computation with fractions and decimals has improved, the scores are still low. In particular, division of decimals was identified as a skill needing more attention. Example B is illustrative of this type of item.

Example B

75 ÷ 2.5

(50) ○ .3
(18) ○ 3
(29) ● 30
(3) ○ 300

Percent Correct	
1975-76	26.3
1976-77	28.1
1977-78	28.8
1978-79	28.5

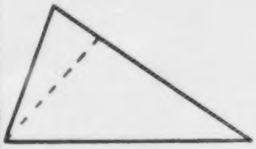
Although student performance has improved on application items over the four year period (significantly for decimal applications), the advisory committee determined that in general this area still needs more instructional emphasis.

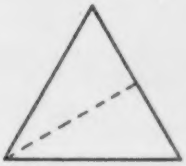
Geometry. The geometry portion of the Survey consists of 20 questions. The average percent correct in the major skill area of geometry increased 0.5 percent correct from 1977-78 to 1978-79. Students increased their average percent correct in six of eight questions concerning knowledge of facts; the average percent correct remained the same on one question and decreased on the other. On the geometric applications students increased their average percent correct in eight of 12 questions and decreased their average percent correct on the other four.

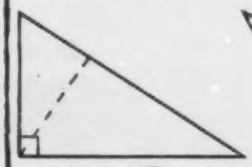
The increase in geometry scores was almost equally divided between knowledge of geometric facts (+0.5) and geometric applications (+0.6) as opposed to the previous year, when most of the increase in geometry was attributed to gains in knowledge of facts (+1.3). Example C is representative of the test items on which scores have increased.

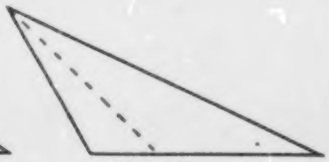
Example C

Which of the following figures is divided by a line of symmetry?


(4) ○


(63) ●


(2) ○


(11) ○

Percent Correct	
1975-76	54.4
1976-77	57.0
1977-78	60.7
1978-79	62.4

The scores in the geometry section seem to indicate that teachers have been placing greater emphasis on informal geometry over the past two years.

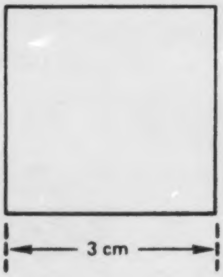
In the judgment of the advisory commitee, greater attention needs to be given to formalizing informal geometric concepts, with emphasis on using the appropriate vocabulary to demonstrate an understanding of these geometric concepts. In particular, students need increased instruction in identifying common geometric figures and in describing their parts.

Measurement and graphs. The *Survey* includes 32 items in the area of measurement and graphs. Fourteen are recall or computation items requiring students to demonstrate an ability to estimate; convert one unit to another; and perform arithmetic operations related to length, mass, volume, and time. The remaining 18 items are word problems dealing with reading and interpretation of graphs (11 items) and measurement of length, area, mass, volume, and time (seven items).

In the overall major skill area of measurement and graphs, students' scores showed an increase of 0.7 percent correct from 1977-78 to 1978-79. Of the 32 items in measurement and graphs, student scores increased on ten of the 14 items involving knowledge of facts and on 17 of the 18 application items.

In the judgment of the advisory committee, the continued improvement in this major skill area reflects the increase in instructional emphasis in California classrooms. The committee noted that students seem to have difficulty distinguishing between the concepts of perimeter and area. For example, when given a problem to compute the area of a square, students most frequently selected the response that was the perimeter. Example D is illustrative of this type of item.

Example D



A side of the square is 3 cm. What is the area of the square?

(18) ○ 3 square cm
(11) ○ 6 square cm
(22) ● 9 square cm
(49) ○ 12 square cm

Percent Correct	
1975-76	19.9
1976-77	20.1
1977-78	22.1
1978-79	21.6

Probability and statistics. The sixth grade Survey includes 12 items on probability and statistics. Six of the items are related to simple statistical computation or based on an intuitive approach to probability. The other six items require the students to apply concepts of probability and statistics to solve problems.

In the major skill area of probability and statistics, the overall percent correct score showed an increase of 0.1 from 1977-78 to 1978-79 (41.6 to 41.7). Seven items showed an increase, and five items showed a decrease.

The advisory committee continues to believe that the scores in the probability and statistics area are far below what should be expected of all students. The lowest scores were found to be on items involving simple terminology, such as "average" and "mean." Since probability and statistical terms are used so frequently in everyday life (for example, "chances of rain," "batting averages," "median salary"), students should be able to understand and use them. Example E is a typical item using common statistical terminology.

Example E

On a mathematics test students obtained the following scores:

68, 75, 80, 86, 95, 100

What is the range of these scores?

(12) ● 32
(5) ○ 42
(19) ○ 68
(26) ○ 100
(38) ○ None of these

Percent Correct	
1975-76	17.2
1976-77	13.7
1977-78	12.9
1978-79	12.1

The advisory committee recommended that more emphasis be placed on classroom instruction in the application of the concepts and skills in probability and statistics since these scores are lower than those on any other section of the mathematics test.

Summary of the Committee's Conclusions and Recommendations

The members of the Mathematics Assessment Advisory Committee were gratified to observe the increase in the mathematics scores of sixth grade students from 1977-78 to 1978-79. The trend of increasing scores in 1978-79 was a continuation of the trends noted during the previous three years.

The pattern of strengths and weaknesses discerned by the committee members in their analysis of the sixth grade math results is summarized in Figure 14.

Figure 14

Mathematics Assessment Advisory Committee's judgments of strengths and weaknesses of sixth grade students in math on the basis of skill area results on the Survey of Basic Skills: Grade 6, 1978-79

Areas of strength	Areas in need of improvement
Computing (+, -, x, ÷) whole numbers and simple fractions	Dividing decimals and applying decimals
Adding and subtracting decimals	Using formulas, such as those for perimeter, area, and volume
Recognizing common geometric shapes	Understanding mean, median, and range and computing probability of simple events
Reading a simple bar graph	

Mathematics Results for Grade Twelve

Test Scope

The Survey of Basic Skills: Grade 12 was developed to assess the degree to which students have acquired "basic" mathematics skills by the end of the twelfth grade. A statewide committee compiled objectives and reviewed questions for inclusion in the test. The 198 questions on the Survey were designed to assess students' skills in the areas of arithmetic, algebra, geometry, measurement and graphs, and probability and statistics. Figure 15 is an illustration of the emphasis given to each skill area in the total test. In the figure the skill area of arithmetic is subdivided into the areas of number concepts, whole numbers, fractions, and decimals. A complete description of the skills assessed in the Survey is given in Test Content Specifications for the Survey of Basic Skills: Mathematics, Grades Six and Twelve (Sacramento: California State Department of Education, 1975). Additional descriptions of the major skills assessed in the Survey and example test questions are included in Appendix G of this report.

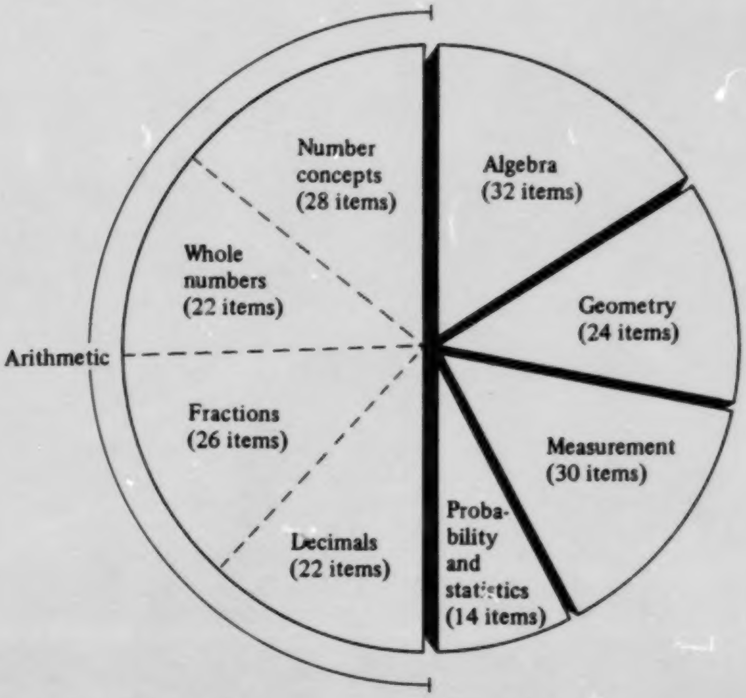


Fig. 15. Skill area emphases in the *Survey of Basic Skills: Grade 12*

Mathematics Scores for Grade Twelve

Table 13 contains the twelfth grade Survey results for 1975-76 through 1978-79. The last three columns of the table show the changes in scores over the same period.

Table 13

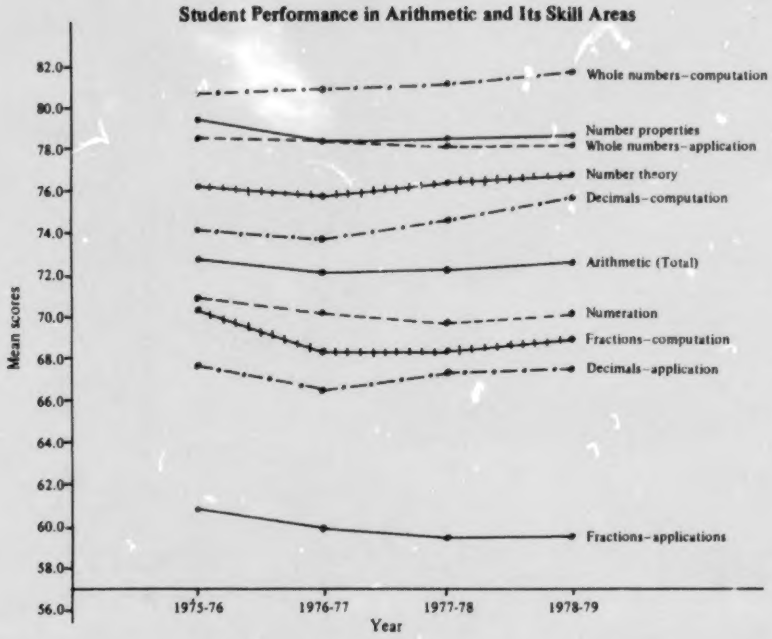
Mathematics Scores of California Twelfth Grade Students on the Survey of Basic Skills: Grade 12

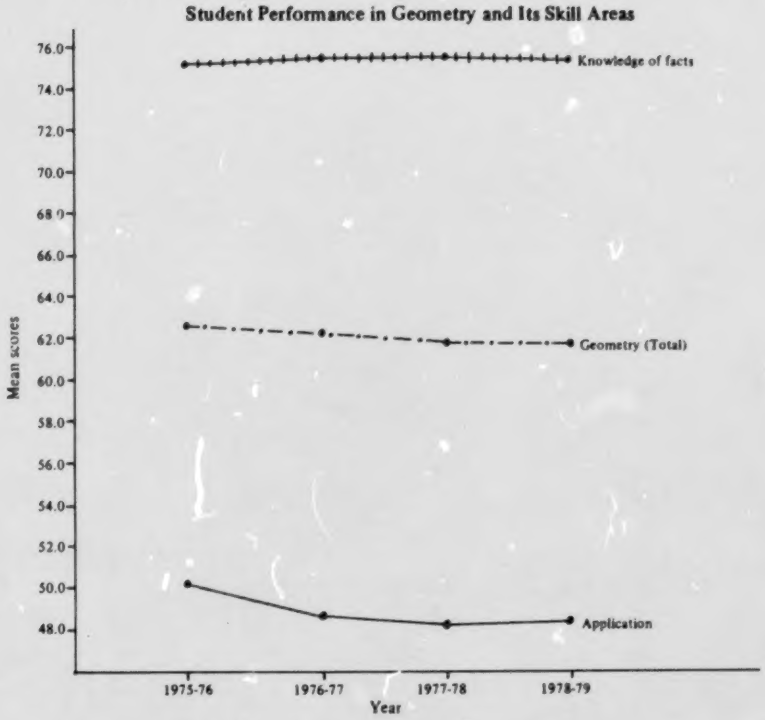
Skill area	Number of questions	Average percent correct				Change		
		1975-76	1976-77	1977-78	1978-79	1975-76 to 1976-77	1976-77 to 1977-78	1977-78 to 1978-79
MATH, TOTAL	**198**	**67.0**	**66.3**	**66.3**	**66.5**	**-0.7**	**0.0**	**+0.2**
Arithmetic	**98**	**72.9**	**72.1**	**72.2**	**72.7**	**-0.8**	**+0.1**	**+0.5**
Number concepts	**28**	**74.3**	**73.5**	**73.6**	**73.9**	**-0.8**	**+0.1**	**+0.3**
Whole numbers	**22**	**80.1**	**80.1**	**80.1**	**80.6**	**0.0**	**0.0**	**+0.5**
Fractions	**26**	**66.0**	**64.5**	**64.3**	**64.7**	**-1.5**	**-0.2**	**+0.4**
Decimals	**22**	**71.8**	**71.2**	**72.0**	**72.9**	**-0.6**	**+0.8**	**+0.9**
Algebra	**32**	**62.9**	**62.1**	**61.8**	**62.1**	**-0.8**	**-0.3**	**+0.3**
Geometry	**24**	**62.7**	**62.1**	**61.8**	**61.8**	**-0.6**	**-0.3**	**0.0**
Measurement and graphs	**30**	**60.5**	**59.5**	**59.4**	**59.0**	**-1.0**	**-0.1**	**-0.4**
Probability and statistics	**14**	**57.2**	**56.9**	**57.3**	**57.4**	**-0.3**	**+0.4**	**+0.1**

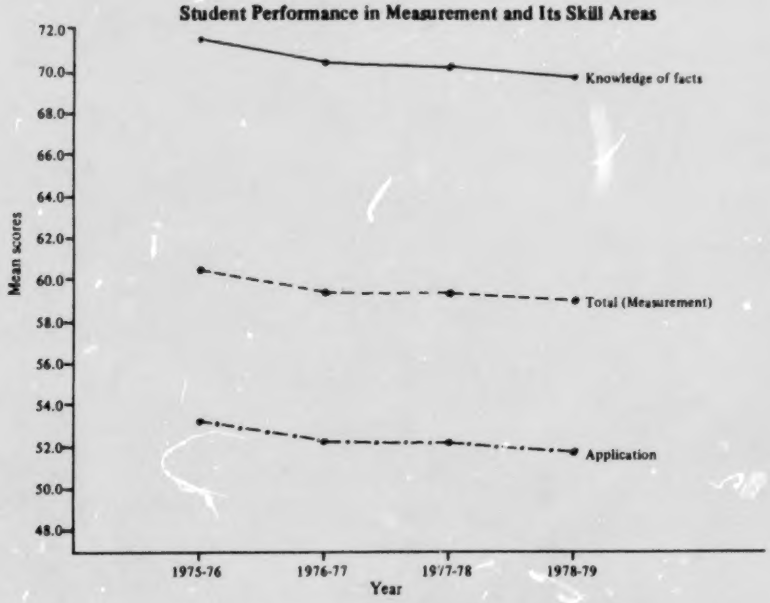
A more detailed breakdown of the skill area results for the four year period is given in Figure 16 . The following overall conclusions are apparent from the data in Table 13 and Figure 16 .

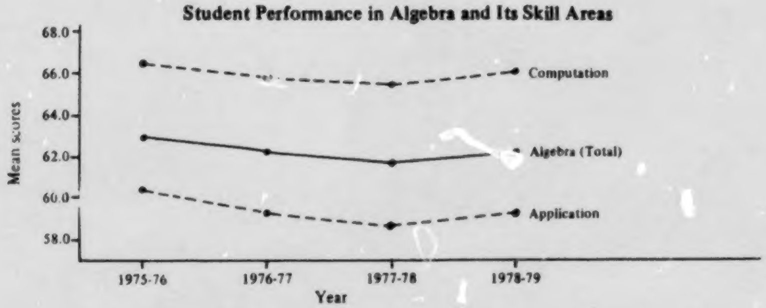
- The overall mathematics achievement of California twelfth grade students improved slightly in 1978-79, after declining from 1975-76 to 1976-77 and remaining constant from 1976-77 to 1977-78.

- From 1975-76 to 1976-77 achievement declined in all skill areas except the area of whole numbers. The greatest decline was in the area of fractions. From 1976-77 to 1977-78 the decline continued in the skill areas of fractions, algebra, geometry, and measurement. However, the skill areas of decimals and probability and statistics showed gains. In 1978-79, student scores improved in all skill areas except two; the scores in


Student Performance in Arithmetic and Its Skill Areas


Student Performance in Geometry and Its Skill Areas


Student Performance in Measurement and Its Skill Areas


Student Performance in Algebra and Its Skill Areas

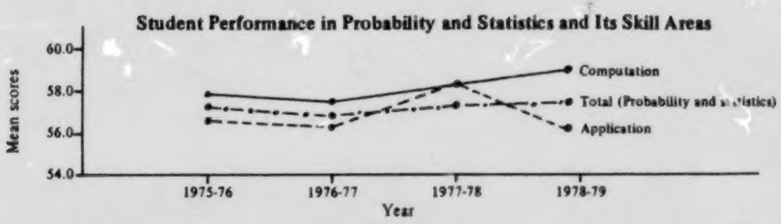

Student Performance in Probability and Statistics and Its Skill Areas

Fig. 16. Graphic representations of average mathematics scores and changes in scores on the *Survey of Basic Skills: Grade 12*, 1975-76 through 1978-79

measurement declined, and the scores in geometry remained the same as in the previous year.

- In 1978-79 the largest gains were registered in decimal computation, followed by whole number computation and number theory.

Analysis and Interpretation of Skill Area Results

As in previous years the California Mathematics Assessment Advisory Committee conducted an in-depth review of the mathematics results, by skill area. The committee members judged the adequacy of student performance in light of the difficulty of the questions, the relative emphasis placed on each skill in a typical classroom, and the changes in student performance over the period of four years.

Arithmetic. The arithmetic portion of the test consists of 98 items in four skill areas--number concepts, whole numbers, fractions, and decimals. There was an overall increase of 0.5 percent correct in arithmetic from 1977-78 to 1978-79.

In the period 1977-78 to 1978-79, student performance in arithmetic increased in all nine subskills. This is the first time, since the initial administration of the current version of the Survey in 1975-76, that scores in arithmetic subskills have uniformly improved.

It was the judgment of the advisory committee that scores in computation with whole numbers and decimals were good when the testing began in 1974-75 and that they have improved modestly over the four year period. The committee felt that there was still a need for improvement in computation with fractions. Example A is an illustration of the type of item on which scores have increased from 1975-76 through 1978-79.

Example A

$$\begin{array}{r} 2{,}759 \\ \times\ \underline{806} \end{array}$$

(4) ○ 233,274 ○ 2,174,754 (3)
(5) ○ 2,173,754 ● 2,223,754 (88)

Percent Correct	
1975-76	84.1
1976-77	85.7
1977-78	86.4
1978-79	87.6

Although student performance has declined slightly on application items over the four year period (a decline of 0.7 percent correct), the committee judged that the scores in applications involving whole numbers were still good but that the scores on applications involving fractions and decimals could be improved.

Algebra. In the major skill area of algebra, the scores showed a small but significant increase in 1978-79. On 17 of 32 items the percent correct responses exceeded 65 percent. The committee is encouraged by this report, particularly in view of the fact that about one-fourth of the students taking the Survey had not taken an algebra course.

In general, students do well on items involving simple equations in one unknown, symbolic graphing, simple line graphs, and coordinate graphing. Students do poorly on items involving word problems, equations in two unknowns, and graphs requiring two-step analysis. Example B illustrates how students typically performed on equation-solving questions.

Example B

If $x = 3t$ and $y = 3t$, then $y =$

○ $9x$ (12)
○ $3x$ (12)
● x (70)
○ $\frac{x}{9}$ (6)

Percent Correct	
1975-76	71.0
1976-77	70.9
1977-78	69.9
1978-79	70.4

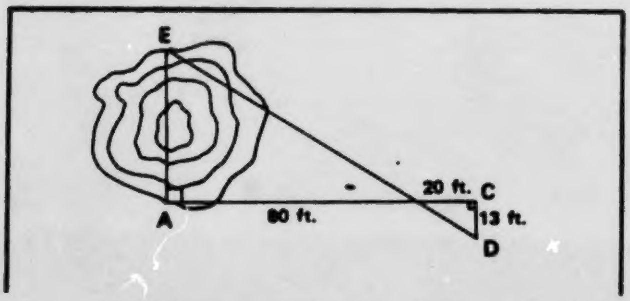
Geometry. The geometry portion of the Survey consists of 24 questions. Half of the questions require students to identify basic geometric sets and figures, and half require them to apply basic geometric knowledge and concepts. The overall average percent correct in 1978-79 was 61.8, which was the same percent correct score as in 1977-78. In the previous two years, the scores had declined by 0.3 and 0.6 percent correct, respectively.

When 1978-79 scores were compared with 1977-78 scores, it was noted that of the 12 questions requiring students to identify geometric figures, the scores increased on three questions, decreased on seven, and remained the same on two. These changes reflected an overall decrease of 0.1 percent correct from the previous year on knowledge of geometric facts.

Of the 12 questions on geometric applications, the scores increased on eight questions and decreased on four questions. These changes amounted to an overall increase of 0.2 percent correct from 1977-78 to 1978-79 on geometric applications. In the previous two years, the scores in this area had decreased by 1.4 and 0.6 percent correct, respectively.

The advisory committee observed that the scores in geometry are no longer declining. However, the committee recommended that increased curricular emphasis be placed on applications of geometric relationships in secondary schools. Example C illustrates a typical skill of this type.

Example C



Percent Correct	
1975-76	36.5
1976-77	33.8
1977-78	32.5
1978-79	32.8

In the figure above, the lines AE and CD are perpendicular to AC. What is the distance from A to E?

(27) ○40 ft.
(33) ●52 ft.
(17) ○60 ft.
(4) ○65 ft.
(19) ○None of these

Measurement. The Survey includes 30 items in the area of measurement; 12 are recall or computation items requiring students to estimate, to convert from one unit to another unit, and to perform arithmetic operations related to length, area, and time. The remaining 18 items are word problems dealing with measurement of length, area, volume, time, and distance. A few of these items require the student to convert within the metric system.

In the overall major skill area of measurement, students' scores showed a decline of 0.4 percent correct from 1977-78 to 1978-79. Student scores on seven of the 12 recall or computation items showed a decline, four showed an increase, and the score on one remained the same. Nine of the 18 application items showed a decrease, eight items showed an increase, and the score on one remained the same.

In the judgment of the advisory committee, the continued decline in this major skill area reflects a decrease in instructional emphasis. The committee also noted that the items involving measurement and consumer mathematics showed a continued significant decrease in average percent correct. Example D illustrates an item assessing consumer math skills.

Example D

A housewife will pay the lowest price per ounce for rice if she buys:

(10) ○ **12 ounces for 40 cents**
(9) ○ **14 ounces for 45 cents**
(36) ● **1 pound, 12 ounces for 85 cents**
(45) ○ **2 pounds for 99 cents**

Percent Correct	
1975-76	39.6
1976-77	36.8
1977-78	36.2
1978-79	35.8

Probability and statistics. The twelfth grade Survey includes 14 items on probability and statistics. In this major skill area, the average percent correct score for 1978-79 was 57.4, an increase of 0.1 percent correct over the score reported in 1977-78.

Six of the 14 items require students to compute the probability of simple events and such statistics as the mean and median of a set of numbers. For these items the 1978-79 scores showed a small increase over the 1977-78 scores. The scores on the eight application questions in 1978-79 were lower than the 1977-78 scores on the same questions.

The committee judged that most students have learned to compute averages and know the term "mean" as an equivalent term. In fact, the scores on these items show significant improvement. On the other hand, only 17.4 percent of the students could answer correctly an item involving the median of a set of numbers. The committee felt that because basic probability and statistical concepts and terminology are common in day-to-day life, classroom instruction should be designed to emphasize applications of these concepts.

Summary of the Committee's Conclusions and Recommendations

The members of the Mathematics Assessment Advisory Committee were pleased to note a slight upward trend in mathematics scores for the first time in eight years--since the introduction of Iowa Tests of Educational Development in 1969. The scores improved slightly in all skill areas except the skill areas of geometry and measurement. This was the second year in a row in which the scores in decimal computation increased significantly.

The pattern of strengths and weaknesses discerned by the committee members in their analysis of the twelfth grade math results is summarized in Figure 17.

Figure 17

Mathematics Assessment Advisory Committee's judgments of strengths and weaknesses of twelfth grade students in math on the basis of skill area results on the Survey of Basic Skills: Grade 12, 1978-79

Areas of strength	Areas in need of improvement
Computing whole numbers	Computing with mixed fractions, decimals, and percents
Performing applications with whole numbers	Performing applications involving fractions and decimals
Solving equations in one unknown	Solving equations in two unknowns
Reading line and bar graphs	Interpreting data from tables and graphs requiring two-step analysis
Recognizing common geometric terms and shapes	Comprehending geometric relationships
Computing with denominate numbers	Understanding mean, median, and range and computing probability of events

Sixth Grade Student Performance in Mathematics, by Subgroups

As part of the administration of the Survey of Basic Skills: Grade 6, teachers provided information on the socioeconomic group to which a student's parents belonged and the sex of the student. In the 1977-78 Annual Report, the mathematics performance of boys and girls was described. The additional information on the socioeconomic status of students' parents in 1978-79 provided for examining the differences in the performance of girls and boys, by socioeconomic group.

Student achievement, by socioeconomic categories. For each student teachers indicated which of four socioeconomic categories the main breadwinner of the student's family belonged to: professional, semiprofessional, skilled, or unskilled. Student scores were aggregated for each of these socioeconomic categories for each of the 15 skill areas and for total math. The results are shown in Figure 18.

Figure 18 shows that the students whose parents were classified as unskilled had the lowest scores of the four groups. Although similar results have been noted before, the skill area patterns in Figure 18 do reveal relative strengths and weaknesses in particular groups of students. Skill area curves that are steeper than the curve for the total math score reveal a relative weakness for the lower socioeconomic groups, and the skill area curves that are flatter than the total math score reveal a relative strength for the lower socioeconomic groups.

Figure 18 shows, for example, that computation with fractions is a relatively weak skill among students whose parents were classified as semiprofessional, skilled, or unskilled. However, for the most part, the score differences of the four groups were relatively even across skill areas.

Student achievement, by sex. Table 14 shows the achievement in mathematics skills for sixth grade girls and boys. In Table 14, data are reported for 1977-78 and 1978-79. The table shows the degree of consistency in the achievement of girls and boys for different skill areas across years. As was reported in the 1977-78 Annual Report, the girls outperformed the boys by considerable margins in the skills of computation with whole numbers, fractions, and decimals in 1978-79. Generally, the boys scored higher than the girls in applications of whole numbers and fractions.

Figure 19 shows the performance of girls and boys for various skill areas, by the four socioeconomic categories. These patterns were graphed to help the reader discern for girls and boys in a socioeconomic category patterns different from those of the general population. Figure 19 reveals that the general patterns in the performance of boys and girls were maintained within each socioeconomic group--with a few exceptions. For example, the girls in the professional category (girls whose parents were classified as professionals) seemed to have a relative weakness in numeration, fraction applications, and geometry concepts. Also, girls in the unskilled category showed a relative weakness in the skill areas of number properties and whole number computation. Boys in the semiprofessional category seemed to have a relative weakness in decimal applications.

The Mathematics Assessment Advisory Committee judged the possible conclusions about patterns of relative strengths and weaknesses, by sex and by socioeconomic category, as tentative. The committee noted the importance of studying the data for several years to confirm any trends.

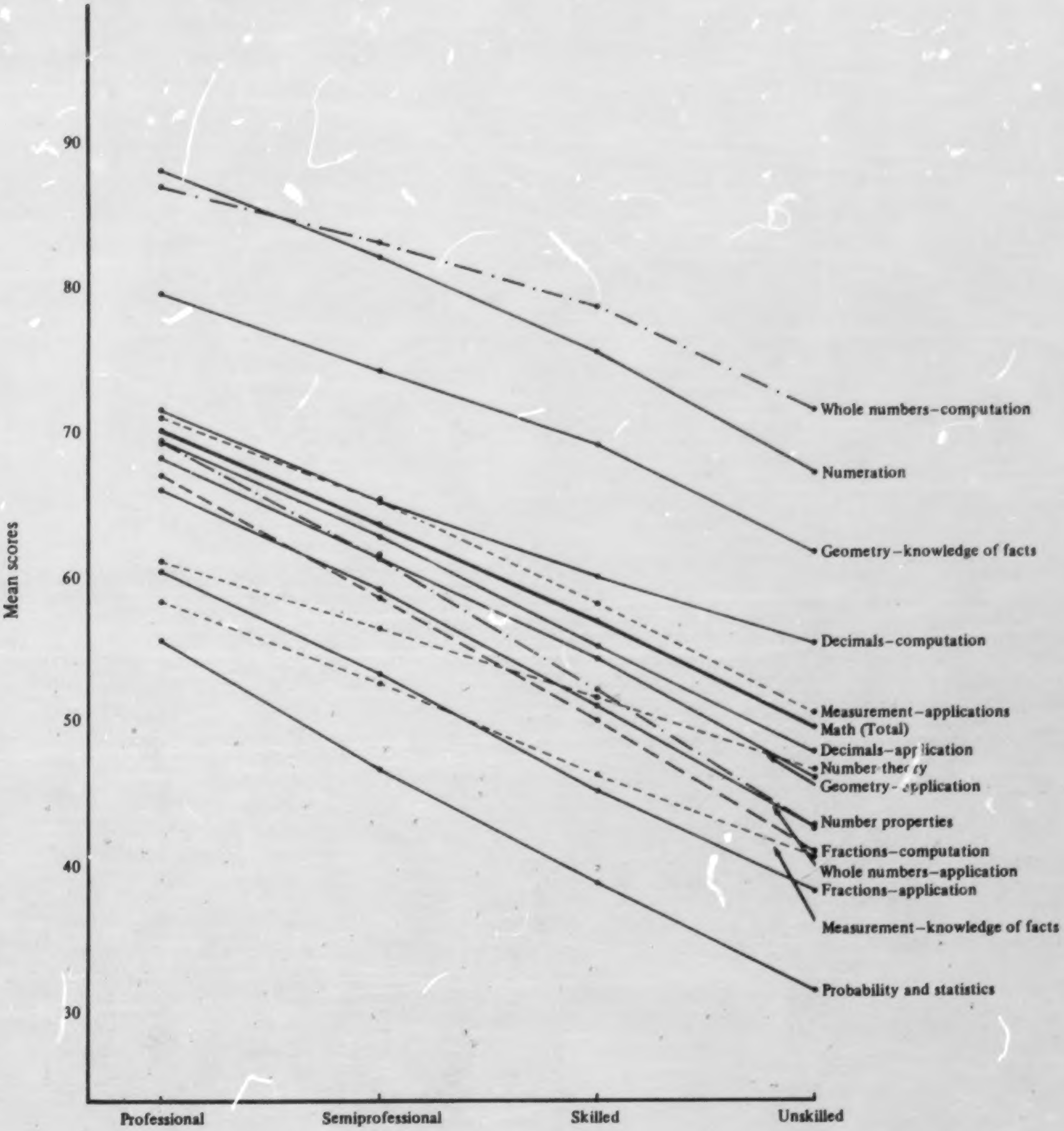


Fig. 18. Student performance in mathematics on the *Survey of Basic Skills: Grade 6*, by skill area and socioeconomic classification of students' parents, 1978-79

Table 14

Mathematics Achievement of Sixth Grade Boys and Girls by Skill Area

Skill area	Description of skill	Number of questions	Year	Number of questions on which: Boys scored higher	Girls scored higher	Percent correct: Boys	Girls
Numeration	Names of numbers, place value, points on a number line	13	1977-78	6	7	76.8	75.8
			1978-79	6	7	77.6	76.7
Number theory	Odd, even, prime, and composite numbers; least common multiple (LCM) and greatest common factor (GCF)	9	1977-78	4	5	55.7	56.3
			1978-79	4	5	56.2	56.6
Number properties	Commutative, associative, and distributive properties	6	1977-78	1	5	55.8	57.5
			1978-79	2	4	55.0	55.8
Whole number computation	Addition, subtraction, multiplication, and division of whole numbers	16	1977-78	0	16	77.0	80.6
			1978-79	0	16	77.8	81.1
Whole number applications	Whole numbers word problems involving one step, two steps, ratios, rounding, or algebraic equations	12	1977-78	10	2	55.1	52.3
			1978-79	10	2	55.2	52.1
Fraction computation	Addition, subtraction, multiplication, and division of fractions	13	1977-78	2	11	50.7	53.3
			1978-79	2	11	51.4	54.4
Fraction applications	Word problems involving operations on proper fractions and mixed fractions	7	1977-78	6	1	49.4	46.3
			1978-79	5	2	49.8	46.9
Decimal computation	Addition, subtraction, multiplication, or division of fractions	12*	1977-78	3	8	59.9	61.3
			1978-79	4	8	60.9	62.3
Decimal applications	Word problems involving one step and money	4*	1977-78	0	4	64.1	68.5
			1978-79	0	3*	65.1	68.6
	Word problems--two steps or complex	4*	1977-78	2	0	47.9	45.9
			1978-79	3	1	48.8	46.7
Geometry--knowledge of facts	Recognition of square, quadrilateral, rectangle, angle, parallel lines, cylinder, pyramid, and diameter	8	1977-78	2	6	69.9	69.5
			1978-79	4	4	70.5	70.0
Geometry--concepts	Concepts involving symmetry, congruency, similarity, locus, and angle relationships in a triangle	12	1977-78	7	5	52.7	51.9
			1978-79	8	4	53.3	52.4
Measurement--knowledge of facts	Conversion of length, mass, area, and time from one unit to another unit; performance of operations on denominate numbers	14*	1977-78	11	3	49.4	46.5
			1978-79	11	2*	50.1	46.9
Measurement--applications	Calculation of area and volume; reading of line, bar, and circle graphs	18	1977-78	12	6	60.7	58.2
			1978-79	11	7	61.3	58.9
Probability and statistics	Computation of probability of simple events; calculation of mean, median, and range	12*	1977-78	10	1	42.6	40.5
			1978-79	11	1	42.8	40.6
TOTAL		160*	1977-78	76	80	58.7	58.3
			1978-79	81	77	59.2	58.8

* The scores for boys and girls were the same on one or more questions.

Note: These results are based upon the responses of approximately 18,500 students on each test question.

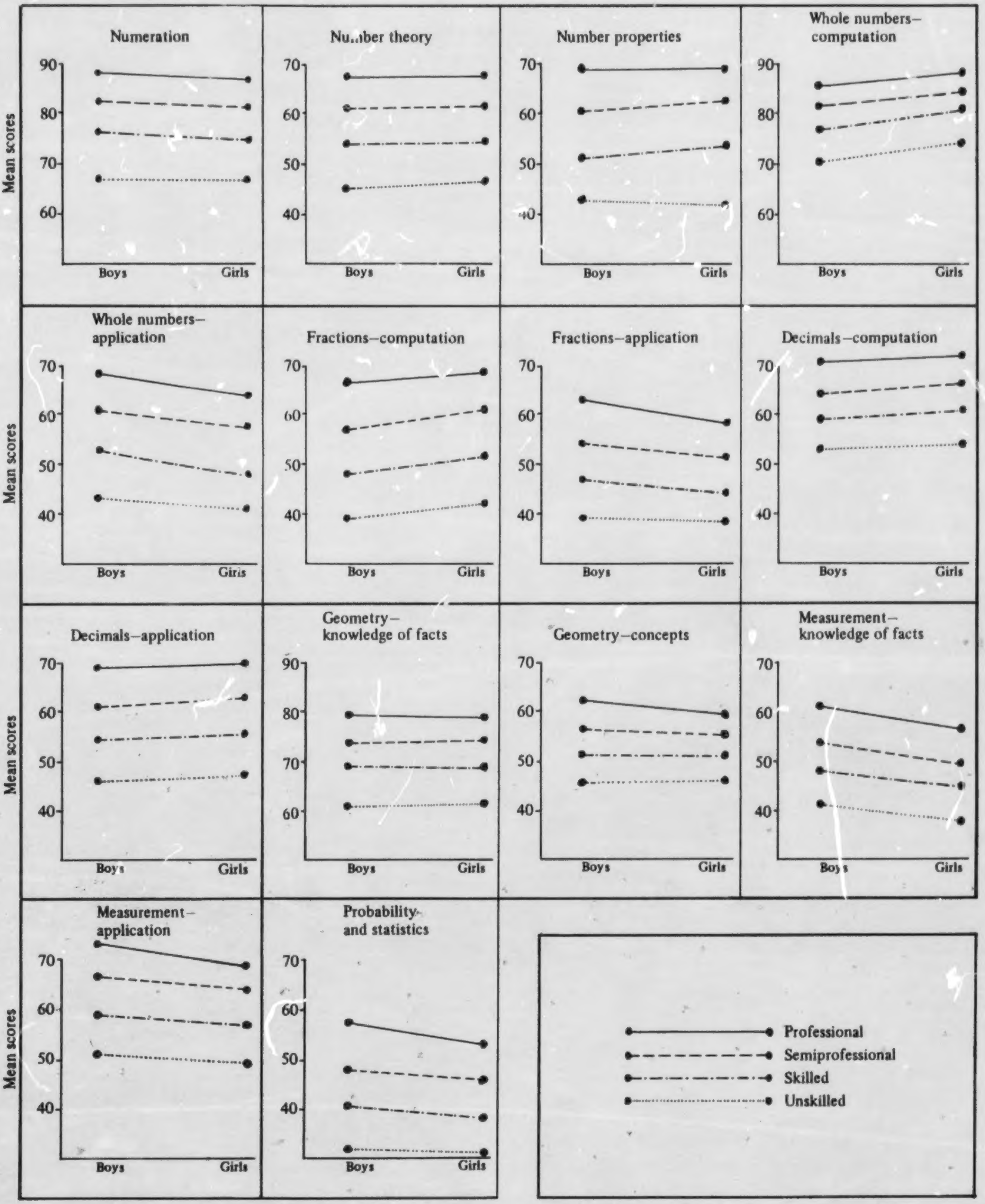


Fig. 19. Average mathematics scores on the *Survey of Basic Skills: Grade 6*, by sex and socioeconomic category, 1978-79

Comparison of the CAP and NAEP Math Results

The National Assessment of Educational Progress (NAEP), funded by the National Institute of Education, conducts achievement assessment of the nation's 9-, 13-, and 17-year olds in several content areas on a five-year cycle. Mathematics was assessed in 1972-73 and again in 1977-78. In September, 1979, NAEP released results of their second assessment in mathematics. These results are based upon a probability sample of 9-, 13-, and 17-year olds. Although the actual test items on the NAEP test and CAP test are not the same, the mathematics content and skill domains have a great deal of overlap between the two assessment systems. However, an important difference between the NAEP and CAP assessments that the reader should bear in mind is the definition of the population on which the assessments were conducted. The NAEP assessment was conducted on the basis of age--9-, 13-, and 17-year olds. The comparable assessment done by the CAP was in grade six and twelve. This difference is not a serious issue here since this comparison will deal only with overall patterns.

The following paragraphs compare the main findings of the NAEP's results for the nation for 1977-78 and CAP's results for California for 1978-79.

Grade six. The California Mathematics Assessment Advisory Committee has been reporting for the past several years that California sixth grade students do quite well in computing with whole numbers. They also do very well in adding or subtracting of fractions and decimals, recognizing common geometric shapes and reading simple bar graphs. Correspondingly, the panel members of mathematics educators convened by the NAEP to interpret their national results reported that most 13-year olds in the nation can compute with whole numbers; that is, in skills related to addition, subtraction, multiplication, and division. The nation's 13-year olds also do well in recognizing simple geometric shapes; for example, the identification of parallel lines.

The Mathematics Assessment Advisory Committee in California has also been indicating for several years that students are weak in problem solving skills; dividing decimals, measurement skills involving the use of formulas for perimeter, area, and volume; and in probability and statistics. The NAEP assessment reflects similar weaknesses. One of the NAEP's panel members commented that, "The NAEP assessment data provide ample evidence that students do not 'think through' problems. Students often are taught 'rules' for dealing with problems. If they forget the rule, they are often unable to solve the problem on their own." According to NAEP's findings the nation's teenagers do not adequately understand the concepts of fractions, decimals, and percents. For example, in calculating 250 divided by .5, 61% of the nation's 13-year olds ignored the decimal point, leading to an answer of 50 instead of 500! The California Mathematics Assessment Committee has reported similar concerns in the area of number concepts and problem solving.

The National Assessment study also reported on changes in mathematics achievement between the first NAEP mathematics survey of 1973 and the 1978 assessment. A number of test items were included in both assessments. The NAEP's findings show that overall mathematics achievement has declined over five years; 13-year olds performed 2 percentage points lower. Over the five-year period, NAEP results indicate mixed results in the general area of computational abilities and a decline in problem-solving ability; although in computational abilities the declines were, in large part, offset by gains. NAEP also reported that 13-year olds improved their knowledge of metric terminology between assessments.

The results of California's sixth grade testing over the five-year period, however, show slightly different trends. The student scores have improved in all skill areas except that of number properties. In California, the area of decimals in general, and decimal computation in particular, has improved the most. The next area showing major gains is the area of measurement and graphs which included questions on metric terminology and metric conversions. (See figure 13 of this report.)

Grade twelve. The NAEP results for the nation's 17-year olds and the CAP results for California's twelfth grade students show similarities in patterns of skill area strengths and weaknesses and in trends over the five-year period.

The 17-year olds of the nation as well as twelfth grade students do well in computing with whole numbers, simple applications of whole numbers, and recognizing common geometric terms and shapes. Students, nationally as well as in California, seem to have difficulty with mixed fractions, decimal division and percents and skills in problem solving.

NAEP's survey findings show that overall mathematics achievement has declined over the past five years. The scores of the nation's 17-year olds in 1978 was four percentage points lower than those of their counterparts five years ago on common items. Over a four year period, in which the same test was administered to twelfth grade students, the score of California students dropped 0.5 percentage points; all of which occurred between 1975-76 and 1976-77. Since CAP assessment is done yearly, CAP has the advantage of pin-pointing the changes in trends. The CAP assessment shows that the scores of California's twelfth grade students stopped declining in 1977-78 and have shown a small upward turn in 1978-79. However, the decline has not yet been offset by comparable gains, resulting in an overall decline in scores over the four-year period.

In 1977-78, as part of the twelfth grade assessment, CAP gathered information on the math courses taken. The scores of students by their mathematical preparation were reported in the 1978-79 Annual Report. The National Assessment in their 1978 assessment conducted a similar study. The overall course patterns of California's twelfth grade students are very much similar to those of the nation's 17-year olds. However, the absolute proportion of California students who take various mathematics courses is not the same as for the nation.

Table 15 shows the percentages of 17-year olds in the nation and twelfth grade students in California taking various mathematics courses. The table shows that the percentage of students taking Algebra I is the same for the nation and California, however, a clear pattern emerges with substantially fewer California students taking higher math courses.

Table 15

Percentages of 17-Year Olds in the Nation and Twelfth Graders in California Taking Various Mathematics Courses

Mathematics course taken	Percent who reported they had taken course	
	Nation's 17-year olds	California's twelfth graders
General math only	(not available)	24
Algebra I	72	73[a]
Geometry	51	46[a]
Algebra II	37	31[a]
Trigonometry	13	5[b]
Probability and statistics	3	(less than 1%)[b,c]
Pre-calculus	4	2[b]

[a] These percentages do not include 2.3% who took unconventional course combinations.

[b] These data are based upon the number of students shown in the October Report for 1977-78. The percentages were computed by dividing the number enrolled in the courses by number of twelfth grade students tested in 1977-78 (244,233).

[c] The actual percentage is .18.

VI. Analyses of Achievement for Subgroups of Pupils

In this section of the report, the statewide achievement findings for third graders are averaged across all schools on the basis of different student characteristics, such as sex, English language fluency, mobility rate, and socioeconomic level. For sixth grade pupils the scores are analyzed by sex, English language fluency, socioeconomic level, pupil mobility, and location of school where enrolled in grade three. Twelfth grade results are analyzed by sex, mobility, and parent education level.

Some Important Cautions

This chapter contains the relative achievement levels and amount of change over a four-year period for the various types of pupils. The findings must be read with extreme care to avoid conclusions that appear sound on the surface but can be shown to be misleading when additional information is added to the analysis.

First of all, the reader should not attempt to view student characteristics out of context. For instance, in looking at the mobility table for grade three, one might conclude that this is a very important factor; however, what makes mobility a relevant variable is its relationship to socioeconomic level, the factor which actually produces the major differences among students' scores and is directly related to the mobility rate of students. Higher socioeconomic level pupils are less mobile and have higher test scores. A second trap the reader should avoid is that of comparing scores across grades or levels of a given student characteristic. These types of comparisons assume consistent background factors, comparable students, and equivalent group variances. Thus, in this report scores will be compared only for students within a characteristic level and grade.

A Pupil-Level Analysis of Achievement and Background Factors
Grade Three

As part of the administration of the Reading Test, teachers provided background information about each pupil. When used with the test results, these data make it possible to compare the performances of groups of pupils with different background characteristics. This section contains an analysis of the effect on pupil performance of four significant background factors: (1) the sex of the pupils; (2) the pupil's English language fluency and possible second language spoken; (3) the socioeconomic level of the pupil's family as determined by the occupational status of the breadwinner in the pupil's family; and (4) the pupil's mobility rate defined as a function of the grade level at which the pupil first entered the school.

Summary of Findings

The following is a summary of the principal effects of the background factors described above on pupil performance in grade three:

Pupil sex. The test achievement of both boys and girls continued to improve in 1978-79. The girls outscored the boys on the Reading Test, but the margin by which the girls lead the boys has generally narrowed over the last three years on both means and percent scoring below the first quartile.

English fluency. The percent of pupils who spoke only English decreased slightly during the four years covered in this report. The percent of pupils who spoke limited English and a second language increased slightly. The highest reading test scores were made by pupils who spoke fluent English and a second language (excluding Spanish). Students who spoke English only came in second; and pupils who spoke limited English plus a second language scored substantially lower than the other two groups. Of the pupils who spoke a second language, Spanish-speaking students scored the lowest on the reading test. Lastly, the mean scores of all language groups increased over the last three years.

Socioeconomic level. The occupation of the principal breadwinner in the pupil's family was more closely related to reading test scores than any other factor. On the average the pupils from families at the highest socioeconomic levels achieved the highest scores on the reading tests, with the pupils from the families at the second highest socioeconomic level achieving the second highest scores, and so forth. The same pattern prevails with regard to percent of pupils who scored below the first quartile, with the pupils from the highest socioeconomic group being least represented in the lower quartile the pupils from the lowest socioeconomic group were the most frequently represented. These trends have been consistent over time, with all groups, excluding unknowns and no-responses, showing an increase in mean scores over the last three years. Lastly, while the gap between pupils in the highest and lowest socioeconomic groups has generally narrowed over the years, this year it remained essentially constant.

Pupil mobility. The pupils showed a consistent increase in mobility (that is, a greater tendency to change schools) over the last three years. The less mobile pupils scored higher than more mobile students. Thus, it appears that stability of enrollment is related to reading test achievement. However, one can see in Table 20 that socioeconomic level is by far a more influential factor, since the wide differences among mobility groups are substantially reduced when socioeconomic level is included in the analysis. Finally, the gap between the more mobile pupils and the less mobile pupils has generally decreased over the last three years in both mean scores and the percent scoring below the first quartile.

Method of Analysis

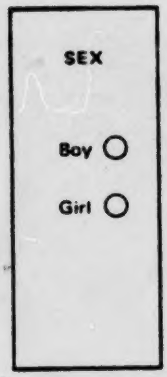
The reading achievement figures for pupils in grade three shown in this section are for 1975-76, 1976-77, 1977-78, and 1978-79. The achievement scores are further broken down to show the comparative scores between students having different background characteristics. For instance, in Table 16 achievement scores of pupils in grade three are divided into scores for boys and girls.

Pupil achievement is expressed in two ways: (1) as the mean reading test score, which is the average percent of correct test answers for the group; and (2) as the percent of students scoring below the first quartile on the reading test, which is the percent of pupils within a student background characteristic group who scored in the bottom 25 percent of all pupils. For instance, in 1978-79 boys in grade three had a mean reading test score of 80.8, which means that they averaged 80.8 percent correct answers on the test (see Table 16). Table 16 also contains the figure 28.1 for grade three boys who scored below the first quartile on the reading test in 1978-79, which means that 28.1 percent of the boys in grade three were in the bottom one-fourth of all third grade pupils tested. Both of these achievement reporting methods aid the reader in interpreting the findings in this report by allowing careful analyses of both the low scoring students and the group as a whole.

Percent below first quartile. Any group of pupils can be divided into the fourths that scored highest, second highest, third highest, and lowest. The first quartile is the score that marks the border between the lowest and the next lowest fourth of the pupils who were tested. One can then use this cutting point as a selection criterion to view the performance of various groups. If any pupil subgroup is overrepresented in this scoring category, that is, by having more than 25 percent in that group, it could be said that the subgroup is having a problem with the test.

For example, in Table 16 it can be seen that the boys have a higher percent in the lower scoring group than the girls (that is, 28.1 percent versus 21.9 percent in grade three). This information coincides with the mean score differences between boys and girls (that is, 80.8 percent versus 83.9 percent), an indication that girls perform better on the test, and indicates that the differences are more or less consistent across achievement levels.

Sex of the pupils. Teachers were asked to designate the sex of each pupil on the pupil's test booklet as follows:



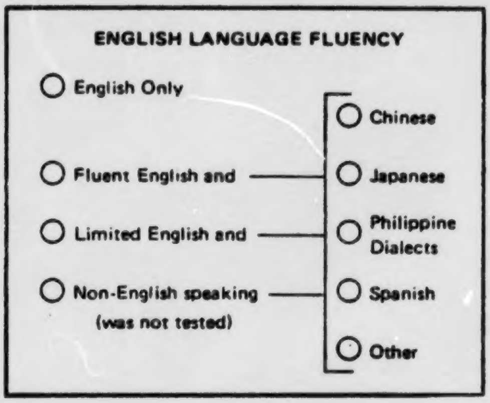
SEX

Boy ○

Girl ○

Slightly more boys than girls were tested in 1978-79 in grade three. Both sexes showed improvement in mean percent correct. Girls answered 83.9 percent of the questions correctly, an improvement of 0.1 percent. The improvement of the boys was slightly better than that of the girls. Boys answered 80.8 percent of the questions correctly, an improvement of 0.3 percent. More boys than girls scored below the first quartile. However, these differences are growing smaller over time.

English language fluency. Teachers were asked to designate the languages that the pupil spoke as follows:



ENGLISH LANGUAGE FLUENCY

○ English Only

○ Fluent English and

○ Limited English and

○ Non-English speaking (was not tested)

○ Chinese

○ Japanese

○ Philippine Dialects

○ Spanish

○ Other

Among the third grade pupils tested, 77.0 percent spoke English only, 14.2 percent spoke fluent English and a second language, 7.1 percent spoke limited English and a second language, and 1.7 percent spoke no English (see Table 17). Spanish was the dominant second language (see Figure 20). From 1977-78 to 1978-79 fewer students spoke English only; and a greater proportion of students were classified as speaking limited English and another language.

Third grade students have generally increased their mean reading scores over the last three years. The pupils who spoke English only performed above the statewide averages (see Table 17: they answered 86.2 percent of the questions correctly (83.3 percent correct is the statewide average). Third grade pupils who spoke fluent English as a second language and whose primary language was other than Spanish achieved even higher scores than pupils who spoke only English (see Figure 21). Particularly high achievement was shown by children who spoke Fluent English and Chinese or Japanese. Pupils who spoke fluent English and Spanish scored considerably below the statewide average, 77.1 percent correct. The average score of speakers of limited English was significantly below the statewide average.

Occupation of the breadwinner in the pupil's family. Teachers were asked to designate as follows the occupational category of the breadwinner in each pupil's family:

SOCIOECONOMIC STATUS

○ Executives, Professionals, and Managers
○ Semiprofessionals, Clerical and Sales Workers, and Technicians
○ Skilled and Semiskilled Employees
○ Unskilled Employees (and Welfare)
○ Unknown

The occupational information permitted a comparison of pupils' scores by the socioeconomic level of their parents. The results are shown on Table 18 and Figure 22. Generally, all socioeconomic groups, excluding unknowns and no responses, have increased their mean reading acores over the last three years.

Table 18 shows the considerable achievement differences between children of different socioeconomic backgrounds. Children whose parents are in the professional categories scored the highest. Similar differences were noted in the percent of pupils who scored below the first quartile. In third grade, 5.9 percent of the pupils whose parents were classified as professionals scored below the first quartile. In contrast, almost half (48.9 percent) of those whose parents were classified as unskilled or receiving welfare scored below the first quartile. Thus, a child from the lowest socioeconomic group was about eight times as likely to score below the first quartile as one from the highest socioeconomic group. Generally, however, the gap between the top and bottom socioeconomic groups has been narrowing over time for both mean scores and percent of students scoring below the first quartile. This year the pupils whose parents were in the unskilled category failed to progress faster than pupils at the high end of the socioeconomic scale, and so that part of the gap remained constant this year.

Pupil mobility. Teachers were asked to designate the grade in which each child first enrolled in the school as follows:

MOBILITY

AT WHAT GRADE WAS THIS PUPIL FIRST ENROLLED AT THIS SCHOOL?
K ○
1 ○
2 ○
3 ○

HAS THIS PUPIL BEEN ENROLLED IN THIS SCHOOL CONTINUOUSLY SINCE THAT TIME?
Yes ○
No ○

This information permits a comparison of pupil scores by the length of time a pupil has attended his or her current school. The results are shown in Tables 19 and 20. Approximately half the pupils tested had not changed schools since their enrollment in kindergarten. However, about one-fourth of the pupils tested had moved to their current school during the third grade.

The mobility rates have continued to increase over the last three years (see Table 19). Third grade pupils showed a decrease in enrollment stability, from 46.3 percent to 44.8 percent. Similarly, more pupils in 1978-79 had been in their current school less than one year at the time of testing than in 1977-78; from 24.2 percent in 1977-78 to 25.4 percent in 1978-79.

Pupils with stable enrollments (that is, longer enrollments at the same school) generally had higher test scores than those who had been in the school a shorter time. Third grade pupils who were in the same school since kindergarten scored 84.1 percent correct; those in the same school since first grade scored 82.8 percent correct; those in the same school since second grade scored 82.1 percent correct; and those enrolled that year scored 79.4 percent correct.

Part of the pattern of higher achievement among the pupils with more stable enrollments can be attributed to the fact that more of these children come from families with higher socioeconomic status. This relationship can be seen in Table 20, which includes figures for both socioeconomic status and mobility.

The data summarized in Table 20 indicate that mobility is mildly related to pupil achievement, in that within each socioeconomic category an increase in mobility does correspond to a slight decrease in mean scores. However, the most mobile children of parents classified as executive/professionals still outscored the most stable pupils from the next lower socioeconomic group, and this relationship is consistent for the other socioeconomic groups as well.

Generally, the more mobile children have been making greater achievement gains than the children of more stable backgrounds, as shown in Table ; thus continuing the closing of the gap between scores of the most and the least mobile groups. For example, third grade children who were enrolled in the same school since kindergarten gained 0.1 percent correct, while those enrolled during the first and second grade scored 0.7 and 0.8 percent correct better than their predecessors. The children who enrolled during the year of testing, however, failed to improve over their counterparts of 1977-78.

Table 16

Reading Test Scores, by Sex
1975-76 through 1978-79

Sex	Year	Percent of Population	Mean Test Scores	Change in Means	Percent Scoring Below First Quartile	Change in Percent Scoring Below First Quartile
		Grade 3	Grade 3	Grade 3	Grade 3	Grade 3
Boys	1975-76	49.9	79.5	--	28.5	--
	1976-77	49.8	79.9	+ .4	28.5	-0-
	1977-78	50.0	80.5	+ .6	28.3	- .2
	1978-79	49.9	80.8	+ .3	28.1	- .2
Girls	1975-76	49.6	83.2	--	21.4	
	1976-77	49.5	83.5	+ .3	21.4	-0-
	1977-78	49.6	83.8	+ .3	21.7	+ .3
	1978-79	49.7	83.9	+ .1	21.9	+ .2

Table 17

Reading Test Scores by English Language Fluency and Other Language Spoken

English Language Fluency	Other Language Spoken	Year	Percent of Population	Mean Test Scores	Change in Means	Percent Scoring Below First Quartile	Change in Percent Scoring Below First Quartile
			Grade 3	Grade 3	Grade 3	Grade 3	Grade 3
STATE TOTAL		1975-76	100.0	81.4		25.0	
		1976-77	100.0	81.7	+ .3	25.0	-0-
		1977-78	100.0	82.2	+ .5	25.0	-0-
		1978-79	100.0	82.4	+ .2	25.0	-0-
English		1975-76	79.3	84.3		19.7	
		1976-77	78.8	84.3	-0-	19.2	- .5
		1977-78	78.5	85.5	+1.2	19.0	- .2
		1978-79	77.0	86.2	+ .7	18.1	- .9
Fluent English	Chinese	1975-76	.6	89.3		9.9	
		1976-77	.6	91.1	+1.8	7.4	-2.5
		1977-78	.7	90.4	- .7	9.2	+1.8
		1978-79	.6	91.2	+ .8	8.8	- .4
	Japanese	1975-76	.4	91.7		6.4	
		1976-77	.4	91.8	+ .1	6.2	- .2
		1977-78	.4	91.9	+ .1	6.7	+ .5
		1978-79	.3	92.0	+ .1	6.8	+ .1
	Philippine Dialects	1975-76	.7	85.6		16.6	
		1976-77	.7	87.5	+1.9	13.3	-3.3
		1977-78	.7	87.7	+ .2	13.5	+ .2
		1978-79	.8	88.4	+ .7	12.3	-1.2
	Spanish	1975-76	10.3	74.5		38.3	
		1976-77	10.5	75.0	+ .5	38.6	+ .3
		1977-78	10.3	75.6	+ .6	38.8	+ .2
		1978-79	10.2	77.0	+1.4	36.7	-2.1
	Other	1975-76	1.6	85.5		17.3	
		1976-77	1.6	86.1	+ .6	16.6	- .7
		1977-78	2.0	86.6	+ .5	17.1	+ .5
		1978-79	2.0	87.3	+ .7	15.3	-1.8
	No Response	1975-76	.2	79.1		30.5	
		1976-77	.2	78.3	- .8	33.1	+2.6
		1977-78	.2	78.0	- .3	31.7	-1.4
		1978-79	.2	79.8	+1.8	32.0	+ .3
	Subtotal	1975-76	13.8	77.5		32.6	
		1976-77	13.9	78.1	+ .6	32.5	- .1
		1977-78	14.3	78.8	+ .7	32.2	- .3
		1978-79	14.2	80.1	+1.3	30.3	-1.9
Limited English	Chinese	1975-76	.2	70.7		45.9	
		1976-77	.2	71.9	+1.2	46.2	+ .3
		1977-78	.2	74.4	+2.5	42.2	-4.0
		1978-79	.2	74.9	+ .5	41.8	- .4
	Japanese	1975-76	[a]	77.2		34.1	
		1976-77	.1	78.3	+1.1	32.1	-2.0
		1977-78	.1	78.3	-0-	34.2	+2.1
		1978-79	.1	79.2	+ .9	31.9	-2.3
	Philippine Dialects	1975-76	.2	70.4		46.6	
		1976-77	.2	71.6	+1.2	45.5	-1.1
		1977-78	.2	74.2	+2.6	43.3	-2.2
		1978-79	.2	75.0	+ .8	41.4	-1.9

Table 17 (Cont.)

English Language Fluency	Other Language Spoken	Year	Percent of Population	Mean Test Scores	Change in Means	Percent Scoring Below First Quartile	Change in Percent Scoring Below First Quartile
			Grade 3	Grade 3	Grade 3	Grade 3	Grade 3
	Spanish	1975-76	4.1	54.5		74.3	
		1976-77	4.7	53.8	- .7	76.6	+2.3
		1977-78	4.9	54.7	+ .9	75.7	- .9
		1978-79	5.8	55.9	+1.2	75.6	- .1
	Other	1975-76	.5	59.5		68.0	
		1976-77	.6	63.6	+4.1	60.7	-7.3
		1977-78	.6	65.6	+2.0	58.6	-2.1
		1978-79	.7	67.0	+1.4	56.1	-2.5
	No Response	1975-76	.1	57.4		68.1	
		1976-77	.1	58.3	+ .9	69.7	+1.6
		1977-78	.1	58.9	+ .6	69.9	+ .2
		1978-79	.1	56.0	-2.9	75.9	+6.0
	Subtotal	1975-76	5.0	56.4		71.3	
		1976-77	5.7	56.2	- .2	72.6	+1.3
		1977-78	6.1	57.2	+1.0	71.6	-1.0
		1978-79	7.1	58.4	+1.2	71.3	- .3
Non-English Speaking		1975-76	1.1	29.1[b]		100.0[b]	
		1976-77	1.1	29.1[b]	-0-	100.0[b]	-0-
		1977-78	1.3	29.1[b]	-0-	100.0[b]	-0-
		1978-79	1.7	29.1[b]	-0-	100.0[b]	-0-
No Response		1975-76	.8	81.1		25.4	
		1976-77	.5	82.5	+1.4	23.4	-2.0
		1977-78	a	82.4	- .1	25.3	+1.9
		1978-79	a	77.4	-5.0	34.6	+9.3

[a] Value less than .05

[b] The computed chance score for pupils who were unable to take the test

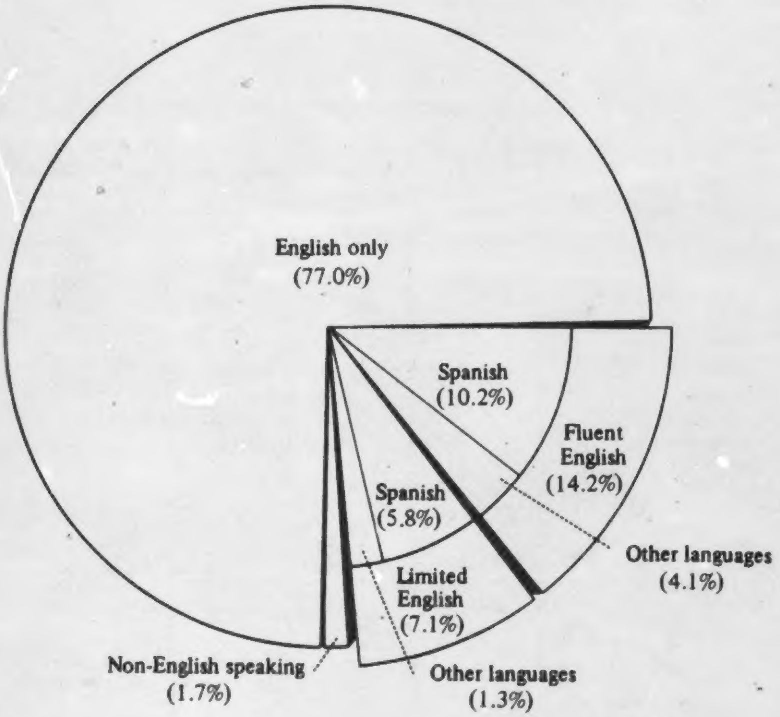


Fig. 20. **Distribution of California third grade pupils according to English language fluency and other language spoken, as coded by their teachers**

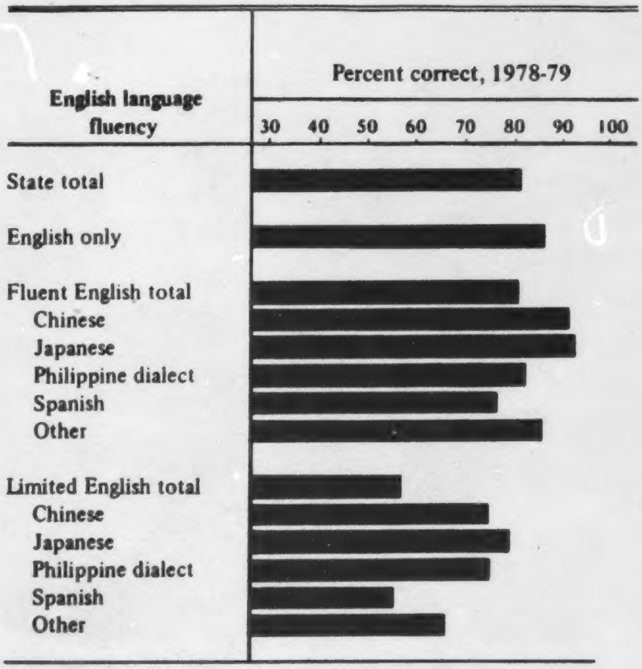


Fig. 21. *Reading Test* scores, by English language fluency and other language spoken, grade three, 1978-79

Table 18

Reading Test Scores by Occupation of Principal Breadwinner in Pupil's Family

Occupation of Principal Breadwinner	Year	Percent of Population	Mean Test Scores	Change in Means	Percent Scoring Below First Quartile	Change in Percent Scoring Below First Quartile
		Grade 3	Grade 3	Grade 3	Grade 3	Grade 3
STATE TOTAL	1975-76	100.0	81.4		25.0	
	1976-77	100.0	81.7	+ .3	25.0	-0-
	1977-78	100.0	82.2	+ .5	25.0	-0-
	1978-79	100.0	82.4	+ .2	25.0	-0-
Executive, Professional of Manager	1975-76	15.9	91.9		6.1	
	1976-77	16.5	92.1	+ .2	6.2	+ .1
	1977-78	16.3	94.4	+ .3	5.9	- .3
	1978-79	15.9	92.6	+ .2	5.9	-0-
Semiprofessional, Clerical, Sales Worker, or Technician	1975-76	21.8	87.8		12.8	
	1976-77	21.5	88.1	+ .3	12.6	- .2
	1977-78	22.1	88.5	+ .4	13.0	+ .4
	1978-79	21.7	88.6	+ .1	12.5	- .5
Skilled or Semiskilled Employee	1975-76	36.8	81.0		25.4	
	1976-77	36.4	81.4	+ .4	25.5	+ .1
	1977-78	36.2	81.9	+ .5	25.6	+ .1
	1978-79	36.8	82.2	+ .3	25.3	- .3
Unskilled Employee	1975-76	18.1	68.1		49.7	
	1976-77	18.2	68.7	+ .6	49.4	- .3
	1977-78	17.6	69.6	+ .9	48.7	- .7
	1978-79	17.3	69.8	+ .2	48.9	+ .2
Unknown	1975-76	5.9	71.5		42.7	
	1976-77	6.0	71.5	-0-	43.2	+ .5
	1977-78	6.3	70.7	- .8	45.7	+2.5
	1978-79	6.5	70.6	- .1	46.6	+ .9
No Response	1975-76	1.5	80.3		26.7	
	1976-77	1.4	79.2	-1.1	29.5	+2.8
	1977-78	1.6	79.0	- .2	30.8	+1.3
	1978-79	1.8	78.0	-1.0	32.5	+1.7

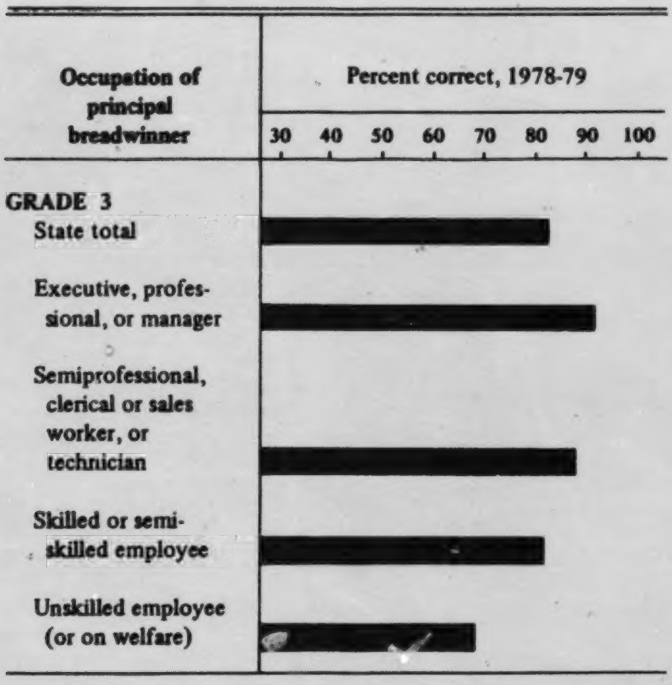


Fig. 22. *Reading Test* scores, by occupation of principal breadwinner in pupil's family, grade three, 1978-79

Table 19

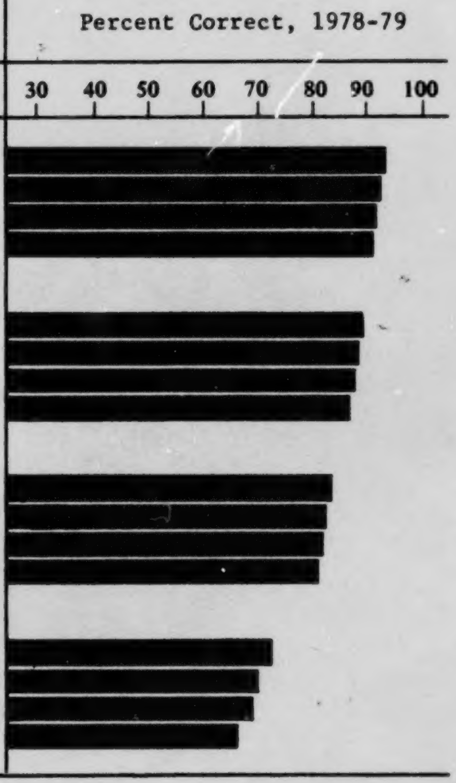
Reading Test Scores by Mobility Rate

Grade in Which Pupil First Enrolled in School of Testing	Year	Percent of Population	Mean Test Scores	Change in Means	Percent Scoring Below First Quartile	Change in Percent Scoring Below First Quartile
		Grade 3	Grade 3	Grade 3	Grade 3	Grade 3
STATE TOTAL	1975-76	100.0	81.4		25.0	
	1976-77	100.0	81.7	+ .3	25.0	-0-
	1977-78	100.0	82.2	+ .5	25.0	-0-
	1978-79	100.0	82.4	+ .2	25.0	-0-
Kindergarten	1975-76	48.4	83.4		21.5	
	1976-77	47.7	83.6	+ .2	21.7	+ .2
	1977-78	46.3	84.0	+ .4	22.0	+ .3
	1978-79	44.8	84.1	+ .1	22.2	+ .2
Grade 1	1975-76	13.1	81.3		25.0	
	1976-77	12.6	81.3	-0-	25.9	+ .9
	1977-78	13.0	82.1	+ .8	25.4	- .5
	1978-79	13.2	82.8	+ .7	24.2	-1.2
Grade 2	1975-76	14.3	80.2		27.0	
	1976-77	14.8	80.6	+ .4	27.0	-0-
	1977-78	15.7	81.3	+ .7	26.4	- .6
	1978-79	15.6	82.1	+ .8	25.5	- .9
Grade 3	1975-76	23.2	77.9		30.8	
	1976-77	24.1	78.8	+ .9	29.7	-1.1
	1977-78	24.2	79.4	+ .6	29.6	- .1
	1978-79	25.4	79.4	-0-	29.6	-0-
No Response	1975-76	.9	76.5		34.0	
	1976-77	.8	78.6	+2.1	31.5	-2.5
	1977-78	.8	78.8	+ .2	31.1	- .4
	1978-79	1.0	77.3	-1.5	34.8	+3.7

Table 20

Statewide Mean Scores on Reading Test, by Socioeconomic Status and Mobility Rate, Grade Three 1978-79

Occupation of Principal Breadwinner	Grade in Which Pupil Was Enrolled in School Where Tested	Percent of Pupils by Grade Level	Percent Scoring Below First Quartile	Mean Reading Test Score
		1978-79	1978-79	1978-79
Executive, Professional, or Manager	Kindergarten	50.6	4.8	93.3
	Grade 1	14.1	5.0	93.0
	Grade 2	14.6	6.6	92.3
	Grade 3	20.7	8.6	91.0
Semiprofessional, Clerical, Sales Worker, or Technician	Kindergarten	45.8	11.6	89.4
	Grade 1	13.6	11.5	89.2
	Grade 2	16.5	12.8	88.8
	Grade 3	24.1	14.2	87.8
Skilled or Semiskilled Employee	Kindergarten	46.4	24.0	83.1
	Grade 1	13.0	24.9	82.4
	Grade 2	17.4	25.5	82.0
	Grade 3	25.1	27.6	80.9
Unskilled Employee or on Welfare	Kindergarten	40.9	45.5	72.4
	Grade 1	13.4	49.0	70.0
	Grade 2	16.2	49.7	69.4
	Grade 3	29.5	52.9	66.5



Student-Level Analysis of Achievement and Background Factors

Grade Six

As part of the administration of the Survey of Basic Skills, sixth grade teachers and students provided information on the following characteristics of the students: sex, English language fluency, socioeconomic level, mobility, and place of third grade enrollment for sixth graders. This section contains the reading and math scores for sixth grade pupils grouped on the basis of the various levels or categories of each variable.

Analysis of Findings

The following sections represent a summary of the findings on the basis of sex, English language fluency, socioeconomic level, and mobility rate of sixth graders.

Sex. Reading and math scores increased from 1977-78 to 1978-79 for both boys and girls (see Table 21). In reading, the boys made slightly greater progress than girls, thereby gradually continuing to close the gap between themselves and the higher scoring girls. The gains for boys and girls were equal in math, allowing the boys to maintain their small advantage.

English language fluency. Table 22 shows the percents of pupils that fell within the various categories of fluency in English and the percents of students who spoke other languages. It also presents their reading and mathematics scores, by fluency in English and the other language that the student spoke. Overall reading scores increased by 0.5 percent correct between 1977-78 and 1978-79. The data for reading shows that the scores for all groups increased except those of the limited-English-speaking pupils who speak a Philippine dialect.

Socioeconomic level. As part of the spring testing, sixth grade teachers were asked, for the first time to indicate the occupational level of the chief breadwinner in the family in a format identical to that printed on the third grade test. Table 23 shows the reading and math averages for the four occupational groups as well as those marked unknown or those not marked. The reader can see that the means for the four groups are distinctly separate, with the pupils from families in which the principal breadwinner was classified as a professional scoring highest and those from families whose principal breadwinner was a less trained worker scoring lowest. This is true for both reading and math, although the disadvantage for pupils from the lower socioeconomic levels is slightly greater in reading.

Mobility. Students were asked to indicate the grade they were in when they first enrolled in their present school. Table 24 gives the percent of pupils in each category. The largest categories of pupils are those who enrolled at the school sometime during the sixth grade and those who had not moved since kindergarten. The groups did not differ substantially in average scores, although there was a trend for the less mobile pupils o score higher than the more recent arrivals at a school.

It is also interesting to study the differences between mobility groups within socioeconomic levels. Table 25 shows the percent of pupils and their average reading and math scores, by parent occupation and by the grade during which they first attended the school of testing. The general patterns of scores and percent enrolled at each grade level are about the same as noted above. The reader can see, however, that the differences among mobility groups is reduced when viewed within socioeconomic categories. Furthermore, the variation among socioeconomic groups is much greater than the difference among mobility groups; as in grade three, the highest scoring mobility group within a socioeconomic level scored lower than any mobility group in the next highest socioeconomic category, thereby showing the greater power of socioeconomic status in explaining differences among pupils.

Location of school of grade three enrollment. Sixth grade pupils were also asked to indicate the location of the school in which they were enrolled in third grade. This information was requested in an attempt to understand more clearly the impact of mobility on achievement scores. Table 26 shows the decreasing proportions of pupils who were enrolled outside the district, state, or country. The highest scoring pupils were those whose third grade enrollment was from outside California (but within the United States), and the lowest scoring pupils were those whose third grade experience was outside the United States. The other three groups were quite similar, although the pupils who have not moved scored slightly higher than the others.

Table 27 presents these percents and scores by English fluency level. It can be seen that pupils who spoke English only were least mobile, pupils who spoke fluent English and another language were more mobile than those who spoke English only, and limited-English-speaking pupils were the most mobile.

It can also be seen that the students who have moved to the school from outside the country are among the highest scoring for the English only and fluent English groups, especially in math, whereas the limited-English-speaking pupils from outside the USA scored much lower in reading. Furthermore, it is obvious that English language fluency is more closely related to scores than the place from which a student emigrated. The variation in scores among the fluency groups is much greater than the variation within the groups. Finally, by comparing these findings with those of Table 22, one can see that the variation among groups according to place of third grade enrollment is less within a given fluency group than it is overall, which shows that to a large degree, the overall differences between pupils grouped on the basis of grade three enrollment can be explained by the greater mobility of fluent English speakers who also spoke another language limited-English-speaking pupils.

Table 21

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by Sex
1975-76 through 1978-79

Sex	Grade Six													
	Reading							Mathematics						
					Change							Change		
	75-6	76-7	77-8	78-9	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9	75-6	76-7	77-8	78-9	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9
State Total	66.1	65.9	66.3	66.8	- .2	+ .4	+ .5	57.4	57.7	58.5	59.0	+ .3	+ .8	+ .5
Boys[a]	64.7	64.5	65.0	65.7	- .2	+ .5	+ .7	57.5	57.9	58.7	59.2	+ .4	+ .8	+ .5
Girls[a]	67.7	67.2	67.6	67.9	- .5	+ .4	+ .3	57.2	57.5	58.3	58.8	+ .3	+ .8	+ .5

[a] Boys represent 50.4 percent of the students tested in grade six.

[b] Girls account for 49.6 percent of the students tested in grade six.

Table 22

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by English Language Fluency
1975-76 through 1978-79

English Language Fluency	Other Language Spoken	Percent of Pupils	Reading							Mathematics						
							Change							Change		
			1975-76	1976-77	1977-78	1978-79	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9	1975-76	1976-77	1977-78	1978-79	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9
State Total		100.0[a]	66.1	65.9	66.3	66.8	- .2	+ .4	+ .5	57.4	57.7	58.5	59.0	+ .3	+ .8	+ .5
English Only		74.2	68.2	68.2	68.6	69.4	-0-	+ .4	+ .8	58.5	59.1	59.7	60.5	+ .6	+ .6	+ .8
Fluent English	Total	15.9	58.6	58.5	59.6	60.9	- .1	+1.1	+1.3	52.2	53.0	54.5	55.2	+ .8	+1.5	+ .7
	Chinese	.7	73.4	73.9	75.5	76.3	+ .5	+1.6	+ .8	69.3	71.0	72.9	72.6	+1.7	+1.9	- .3
	Japanese	.3	76.6	76.2	78.0	78.7	- .4	+1.8	+ .7	68.9	69.5	70.3	72.7	+ .6	+ .8	+2.4
	Philippine Dialect	.7	64.3	64.9	67.8	68.6	+ .6	+2.9	+ .8	58.0	59.0	61.6	62.5	+1.0	+2.6	+ .9
	Spanish	11.5	55.7	55.5	56.3	57.3	- .2	+ .8	+1.0	49.3	50.0	51.2	51.7	+ .7	+1.2	+ .5
	Other	2.4	66.3	65.7	66.7	68.4	- .6	+1.0	+1.7	58.8	60.6	61.4	62.4	+1.8	+ .8	+1.0
Limited English	Total	4.4	38.7	37.8	39.2	40.1	- .9	+1.4	+ .9	43.2	43.3	44.3	44.6	+ .1	+1.0	+ .3
	Chinese	.2	43.9	43.4	44.4	48.2	- .5	+1.0	+3.8	60.0	59.4	61.4	63.2	- .6	+2.0	+1.8
	Japanese	.0	44.5	52.3	48.8	52.9	+7.8	-3.5	+4.1	60.9	66.1	72.7	71.7	+5.2	+6.6	-1.0
	Philippine Dialect	.1	44.4	47.2	49.5	47.6	+2.8	+2.3	-1.9	48.5	47.5	50.2	49.2	-1.0	+2.7	-1.0
	Spanish	3.3	38.0	36.7	37.9	38.8	-1.3	+1.2	+ .9	40.6	40.6	41.6	41.6	-0-	+1.0	-0-
	Other	.6	39.4	39.1	43.5	42.8	- .3	+4.4	- .7	52.8	52.5	54.5	53.7	- .3	+2.0	- .8

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[a] Includes 1.2 percent who were identified as non-English speaking and 5.4 percent non-response.

Table 23

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by Occupation of the Principal Breadwinner in the Pupil's Family 1978-79

Occupation of principal breadwinner	Percent of population	Mean test score	
		Reading	Mathematics
State Total	100.0*	66.8	59.0
Executive, professional, or manager	14.0	79.3	70.1
Semiprofessional, clerical, sales worker, or technician	17.1	73.3	63.7
Skilled or semiskilled employee	32.5	62.2	57.1
Unskilled employee	15.0	54.0	49.6
Unknown	6.3	57.6	51.7

* Includes 15.1 percent non-response

Table 24

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by Mobility

Mobility (Grade in which pupil first enrolled)	Percent of population	Mean test score	
		Reading	Mathematics
State Total	100.0*	66.8	59.0
Kindergarten	25.6	68.8	60.6
Grade 1	6.1	67.7	59.7
Grade 2	5.3	67.5	59.6
Grade 3	7.1	66.2	58.4
Grade 4	11.3	66.2	58.7
Grade 5	13.4	65.9	58.1
Grade 6	30.3	66.0	58.3

* Includes .9 percent non-response

Table 25

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by Occupation of the Principal Breadwinner of Pupil's Family and by Grade First Attended This School 1978-79

Occupation of Principal Breadwinner	Grade in Which Pupil First Enrolled in School of Testing	Percent of Population	Reading	Mathematics
State Total		100.0	66.8	59.0
Executive, Professional or Manager	Total	14.0	79.3	70.1
	Kindergarten	4.0	80.3	71.1
	Grade 1	.9	80.0	70.8
	Grade 2	.8	79.3	70.0
	Grade 3	1.0	79.3	70.0
	Grade 4	1.6	79.4	70.0
	Grade 5	1.6	78.8	69.2
	Grade 6	4.0	78.6	69.3
Semiprofessional, Clerical, Sales Worker, or Technician	Total	17.1	73.3	63.7
	Kindergarten	4.6	74.5	64.7
	Grade 1	1.1	73.9	64.4
	Grade 2	.9	73.4	64.0
	Grade 3	1.3	73.4	63.5
	Grade 4	2.0	73.4	63.7
	Grade 5	2.3	72.7	62.8
	Grade 6	4.9	72.6	63.2
Skilled or Semiskilled Employee	Total	32.5	62.2	57.1
	Kindergarten	8.7	66.5	58.1
	Grade 1	2.0	65.6	57.8
	Grade 2	1.8	65.7	57.3
	Grade 3	2.3	64.7	56.7
	Grade 4	3.6	66.7	57.1
	Grade 5	4.5	65.1	57.1
	Grade 6	9.3	64.5	56.4
Unskilled Employee	Total	15.0	54.0	49.6
	Kindergarten	3.4	56.7	51.4
	Grade 1	.9	55.5	50.0
	Grade 2	.8	54.6	50.3
	Grade 3	1.1	52.2	48.9
	Grade 4	1.9	52.8	49.1
	Grade 5	2.2	53.3	48.8
	Grade 6	4.5	53.3	49.1
Unknown	Total	6.3	57.6	51.7
	Kindergarten	1.2	59.4	53.0
	Grade 1	.3	57.7	51.1
	Grade 2	.3	58.0	52.2
	Grade 3	.4	55.8	50.0
	Grade 4	.7	57.1	50.0
	Grade 5	.8	56.1	51.1
	Grade 6	2.4	58.0	52.3

Table 26

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics by School Where Pupil Was Enrolled in Grade Three 1978-79

School where pupil was enrolled in grade three	Percent of population	Mean test score	
		Reading	Mathematics
State Total	100.0*	66.8	59.0
School of Testing	41.2	68.3	60.2
Different chool in istrict	26.3	65.7	57.8
Different istrict in California	21.3	67.5	58.8
Outside California but in USA	6.8	70.5	61.2
Outside USA	3.1	49.4	53.5

* Includes 1.3 percent non-response

Table 27

Survey of Basic Skills: Grade 6 Scores for Reading and Mathematics
by Language Fluency and Where Enrolled in Grade 3
1978-79

English language fluency	School where pupil was enrolled in grade three	Percent of pupils	Mean test score	
			Reading	Mathematics
State Total		100.0	66.8	59.0
English Only	Total	74.2	69.4	60.5
	This School	31.4	70.3	60.6
	Different School	19.0	68.1	61.7
	Different District in CA	16.9	68.8	59.4
	Outside CA but in USA	5.7	71.6	59.5
	Outside USA	.6	71.6	61.6
Fluent English	Total	15.9	60.9	55.2
	This School	6.7	61.6	55.5
	Different School	4.9	59.7	53.7
	Different District in CA	2.6	61.8	55.6
	Outside CA but in USA	.6	65.3	59.0
	Outside USA	.8	58.7	59.2
Limited English	Total	4.4	40.1	44.6
	This School	1.1	44.0	44.3
	Different School	1.0	43.2	42.8
	Different District in CA	.5	43.6	44.9
	Outside CA but in USA	.1	48.3	47.5
	Outside USA	1.5	34.4	46.2

Student-Level Analysis of Achievement and Background Factors

Grade Twelve

As part of the administration of the *Survey of Basic Skills: Grade 12*, students provided certain information about themselves: sex, educational level of their parents, mobility (number of times they had changed schools since the end of grade six), number of years of English completed, and number of reports or essays written in the six weeks immediately preceding testing (which took place in December). This section presents scores by sex, parent education level, and mobility rate. Chapter IV contains a section in which the written expression scores are analyzed on the basis of number of English courses taken and number of essays or reports written.

Analysis of Findings

Findings, by sex, parents' education levels, and mobility are discussed below.

Sex. Table 28 shows that the reading scores for both boys and girls declined by 0.1 percent correct. Boys continued to score below girls by 0.1 percent correct.

In math, the scores of both boys and girls improved, but the girls' rate of improvement was much greater than the boys'. This is in contrast to the results of previous years, in which the scores were declining, but girls' scores were declining faster. Girls now score 4.5 percent correct below the boys.

Parent education. Table 29 shows the percent of pupils who indicated which of five educational levels their most educated parend had achieved. It also gives the mean reading and math scores for each group of students. For both content areas the trend is the same: higher scores are associated with a higher educational background. It is interesting to note, however, that the trend is slightly steeper for mathematics.

Mobility. On the back of the test booklet, students were asked to indicate how many times they had changed schools since the end of the sixth grade because they had moved to a different house. The results are presented in Table 30. Almost two-thirds (62.3 percent) of the seniors had not moved at all since grade six; another one-sixth (17.6 percent) had moved only once. On the other hand, one could say that almost 20 percent (19.5 percent) of the state had moved at least twice, or could one could say that more than 3,000 students indicated they had moved at least six times since grade six.

The score pattern is similar to that noted for grades three and six: lower average scores are associated with more frequent moves, with a slightly stronger trend for mathematics.

As was done for grades three and six, the score trends for mobility are also presented according to socioeconomic level (parent education in this case). Table 31 shows this analysis.

It can be seen that substantial differences continue to exist among parent education groups, with almost no overlap; i.e., the highest scoring mobility group in one parent education category is lower than the lowest mobility rate group in the next higher parent education level. Furthermore, for the three lowest educational levels, the score spread across mobility levels within a parent education category is less than when parent education is not considered in the analysis; however, for "four-year college and advanced degree," the score spread is even wider.

Table 28

Survey of Basic Skills; Grade 12 Scores for Reading and Mathematics by Sex
1975-76 through 1978-79

Sex	Grade Twelve													
	Reading							Mathematics						
					Change							Change		
	75-6	76-7	77-8	78-9	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9	75-6	76-7	77-8	78-9	75-6 to 76-7	76-7 to 77-8	77-8 to 78-9
State Total	64.1	63.6	63.3	63.2	- .5	- .3	- .1	67.0	66.3	66.3	66.5	- .7	-0-	+ .2
Boys[a]	64.0	63.4	63.3	63.2	- .6	- .1	- .1	69.4	68.7	68.7	68.8	- .7	-0-	+ .1
Girls[a]	64.3	63.8	63.4	63.3	- .5	- .4	- .1	64.0	63.9	63.9	64.3	- .1	-0-	+ .4

[a] Boys represent 49.4 percent of the students tested in grade twelve.

[b] Girls account for 50.6 percent of the students tested in grade twelve.

Table 29

Survey of Basic Skills: Grade 12 Scores for Reading and Mathematics by Parental Education, 1978-79

Highest educational level of student's parent	Percent of Students	Reading	Mathematics
STATE TOTAL	100.0*	63.2	66.5
Not a high school graduate	11.3	53.5	55.9
High school graduate	26.0	59.4	61.5
Some college	26.6	64.6	67.3
Four-year college	18.0	67.2	71.5
Advanced degree	16.4	70.1	74.7

* Includes .7 percent non-response.

Table 30

Survey of Basic Skills: Grade 12 Scores for Reading and Mathematics by Mobility, 1978-79

Mobility (Number of times student changed school)	Percent of Population	Reading	Mathematics
STATE TOTAL	100.0*	63.2	66.5
None	62.3	64.3	67.4
Once	17.6	63.1	66.3
2	8.3	60.6	64.0
3	5.7	60.2	63.2
4	2.9	59.4	62.5
5	1.3	59.1	62.0
6 or more	1.3	58.0	59.9

* Includes .6 percent non-response.

Table 31

Survey of Basic Skills: Grade 12 Scores for Reading and Mathematics by Parental Education and by Mobility, 1978-79

Highest educational level of the parent	Number of times student changed school	Percent of population	Reading	Mathematics
STATE TOTAL		100.0*	63.2	66.5
Advanced degree	Total	16.4	70.1	74.7
	None	10.5	71.3	76.0
	Once	2.9	69.4	74.6
	2	1.3	68.4	72.5
	3	.9	67.0	70.2
	4	.4	65.8	69.3
	5	.2	65.0	68.4
	6 or more	.2	62.1	65.1
Four-year college	Total	18.0	67.2	71.5
	None	11.3	68.5	72.9
	Once	3.3	67.0	71.5
	2	1.5	64.3	68.7
	3	1.0	63.4	68.1
	4	.5	62.3	67.1
	5	.2	60.3	65.1
	6 or more	.2	59.3	62.3
Some college	Total	26.6	64.6	67.3
	None	16.4	65.5	68.4
	Once	4.8	64.6	67.4
	2	2.2	62.1	65.4
	3	1.6	62.3	64.2
	4	.8	61.3	64.2
	5	.4	62.0	63.9
	6 or more	.4	62.0	62.6
High school graduate	Total	26.0	59.4	61.5
	None	16.4	60.5	62.5
	Once	4.4	59.4	61.5
	2	2.2	56.6	59.5
	3	1.5	56.4	59.0
	4	.8	55.8	58.0
	5	.3	54.9	58.7
	6 or more	.3	56.0	57.3
Not a high school graduate	Total	11.3	53.5	55.9
	None	6.9	54.3	56.5
	Once	2.0	53.4	56.5
	2	1.0	51.6	54.2
	3	.7	51.3	54.7
	4	.3	52.2	54.8
	5	.2	54.2	55.1
	6 or more	.2	49.9	53.5

* Includes 1.7 percent non-response.

VII. Comparisons with National Norms

Some of the difficulties in using publishers' national norms to judge the adequacy of the performance of California students are discussed in Chapter II. Briefly, the two main problems are (1) lack of agreement among publishers' samples; and (2) lack of timeliness. Any comparison based on a single publisher's norm group (a national sample of students tested at a given time) can be quite misleading and is a tenuous undertaking at best. Since no test is given nationwide, one must rely on various publishers' estimates of the nationwide distribution of test scores. These estimates vary from publisher to publisher and are clearly "guesstimates." Part of the problem in establishing norms is that publishers are dependent upon the goodwill and cooperation of the districts they select to administer their tests. When the districts that have been carefully selected as part of a national sample decline to participate in the norming study, the results become that much more uncertain. In addition, because of the expense involved, publishers are not able to update their norms more than once every five to eight years.

To cope with this situation, the Department of Education compares the performance of California students with the norms of a variety of tests and updates the comparisons whenever the tests are renormed or when new tests become available. This is done by giving a sample of California students both the publisher's standardized test and the California test. In some cases no extra testing is required. Scores for a publisher's standardized test are simply collected from the school districts that administered the test to all of their students in certain schools for other purposes. The statistical techniques used to equate the two tests are briefly described in Appendix H. The result of this type of "equating study" is to show how California students would have compared to a national norm group if, in fact, all California students had taken the published test.

This approach has several advantages: (1) the national comparisons are more timely since they can be updated as new norms become available; (2) the estimates are more stable since they do not depend on the representativeness of a single publisher's sample; and (3) the progress of California students can be assessed with a test that fits the objectives of the instructional program and simultaneously, with no additional testing, can be compared to national norms.

The new comparisons presented in this report are based on the tests with the most recent national norms available. This report also contains the results of earlier equating studies so that the reader can inspect the long-term (from ten to 13 years) achievement test trends in California against the backdrop of national norms.

Grade Three

Table 32 contains the estimated national percentile ranks of the median score of California third grade pupils' performance on the Reading Test since 1966-67. The trend over the years is clearly one of growth, with the third grade scores increasing from the 34th to the 38th percentile rank on the Stanford Reading Test, at the 52nd on the Cooperative Primary Reading Test, and now increasing from the 55th to the 58th on the Comprehensive Tests of Basic Skills (CTBS). Figure 23 is a pictorial display of these trends.

The following observations should help the reader understand more fully the national comparisons.

1. The third grade results for 1966-67 through 1970-71 were based on the Stanford Reading Test, which was administered to all third grade pupils in California. The norms for the Stanford Reading Test were established in 1963. Thus, the gains that occurred each year are relative to those norms.

2. The third grade results for 1971-72 through 1972-73 were based on the Cooperative Primary Reading Test (CPRT), which was administered to all third grade pupils in California. The norms for the CPRT were established in 1966. The dramatic increase of scores in the changeover years was due largely to the great differences between the norms of the Stanford Reading Test and those of the CPRT.

3. In 1973-74 the California Assessment Program developed the Reading Test. A systematic sample of one-ninth of all students tested in grade three was used in an equating study to estimate the performance of the median pupil in California relative to 1966 Cooperative Primary Reading Test norms. The results indicated little change from those of the previous year.

4. In 1974-75 the Reading Test was revised and administered to all third grade pupils in California. The same test was used in 1975-76, 1976-77, 1977-78, and 1978-79. The results of an equating study, described in Appendix H, were used to estimate the performance of California pupils in comparison to the norms established in 1973 for the Comprehensive Tests of Basic Skills (CTBS), Form S. As a result of the modest increases over the last three years, the median score for California pupil performance in grade three in 1978-79 was at the 58th percentile of CTBS 1973 norms.

Grade Six

The performance of sixth graders in California declined in the early 1970s and leveled off by 1974. It has climbed steadily since then. Table 33 shows that the median California sixth grade student's performance in 1978-79 was slightly above the national sample tested in 1973 by the makers of the Comprehensive Tests of Basic Skills. Figure 24 is a graphic representation of these trends. Reading performance, with a percentile rank of 55, continued to be slightly higher than that of language (52) and mathematics (54).

A more complete description of these findings is given below:

1. From 1969-70 to 1973-74 the Comprehensive Tests of Basic Skills (Form Q, 1968 norms) was administered to all California sixth grade students. During this period the performance of California students declined from four to nine percentile ranks on the basis of the 1968 norms.

2. In 1974-75 the first version of the California Assessment Program test, the Survey of Basic Skills, was administered statewide. An equating study that was conducted that year showed that scores had improved and that if the Comprehensive Tests of Basic Skills had been administered statewide, the percentile ranks would have gone up to 48, 43, and 44 for reading, language, and mathematics, respectively.

3. A revision of the Survey was administered in 1975-76, 1976-77, 1977-78, and 1978-79. An equating study, described in Appendix H, showed that on the basis of the 1973 version of the CTBS, California students improved enough in 1975-76 to equal or exceed the national average in reading and mathematics. Following the upward trend of earlier years, the 1978-79 improvement in language and mathematics achievement boosted the percentile ranks to 52 and 54, respectively. The percentile rank for reading remained at 55, unaffected by the improvement reflected in the percent correct score.

Grade Twelve

The performance of twelfth grade students in California has been declining consistently since testing began in 1969-70. By 1976-77 the median high school senior was at the 42nd, 33rd, and 43rd percentile ranks in reading, written expression, and mathematics, respectively, on the basis of the Iowa Tests of Educational Development with its 1962 norms. On the basis of tests with more recent norms the ranks were even lower (see Table 34 and Figure 25).

Results for 1978-79 showed some progress. Reading continued to decline, with percentile ranks of 41, 32, and 34 for the three tests used to establish national comparisons. An improvement in written expression scores brought the percentile ranks to 34, 27, and 28. Mathematics percentiles held steady at 43, 41, and 43, in spite of the percent correct increase.

Table 32

Estimated National Percentile Ranks of Median California Pupil Performance
1966-67 through 1978-79
Grade Three

Grade	Test administered												
	Stanford Reading Test					Cooperative Primary Reading Test		Reading Test[a]	Reading Test[b] (Revised)				
	1966-67	1967-68	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Grade 3	34	34	36	36	38	52	52	52	55	55	56	57	58
Norms:	Stanford, 1963 norms					CPRT, 1966 norms			CTBS, 1973 norms				

[a] The new California test, the Reading Test, was first administered in 1973-74. The percentile ranks are based on an equating of the Reading Test and the Cooperative Primary Reading Test, forms 23A and 23B, normed in 1966.

[b] The revised Reading Test was administered to all California pupils in 1974-75, 1975-76, 1976-77, 1977-78, and 1978-79. The percentile ranks are based on equating studies of the revised Reading Test and the Comprehensive Tests of Basic Skills, Form S, normed in 1973.

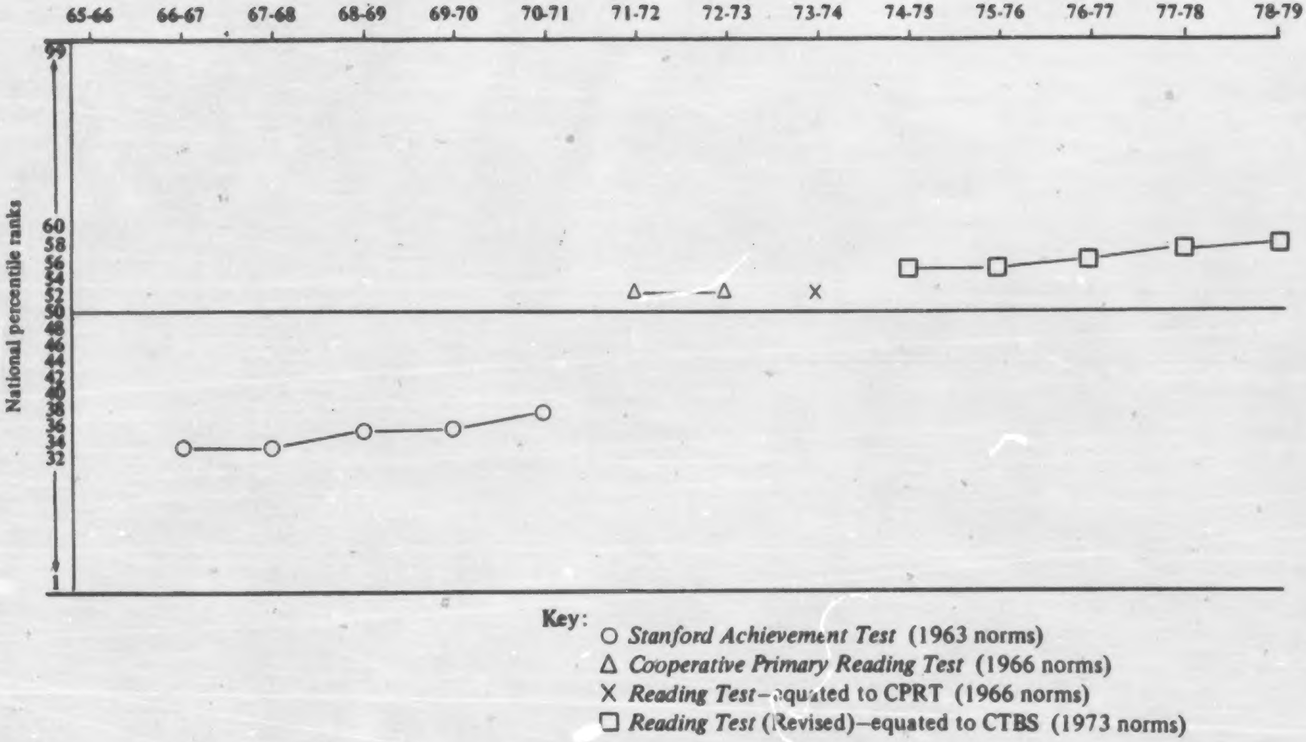


Fig. 23. National percentile ranks of median California pupil performance, 1965-66 through 1978-79, grade three

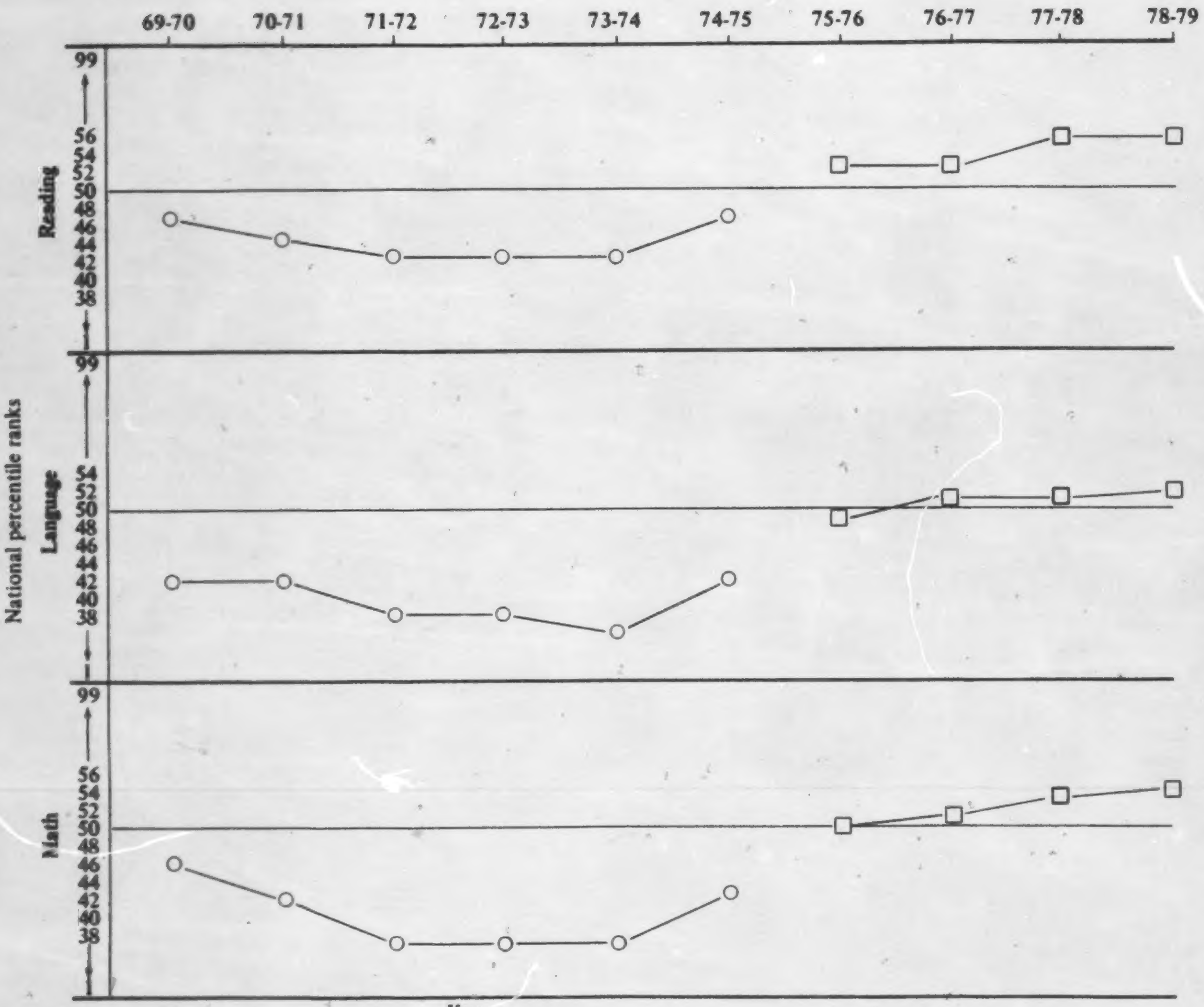
Table 33

Estimated National Percentile Ranks of Median California Student Performance 1969-70 Through 1978-79 Grade Six

Content area	Test administered									
	Comprehensive Tests of Basic Skills					Survey of Basic Skills[a]	Survey of Basic Skills[b] (Revised)			
	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-7
Reading	48	46	44	44	44	48	53	53	55	55
Language	43	43	39	39	37	43	49	51	51	52
Mathematics	47	43	38	38	38	44	50	51	53	54
Norms:	CTBS, 1968 norms						CTBS, 1973 norms			

[a] The new California test, the Survey of Basic Skills: Grade 6, was first administered to all California pupils in 1974-75. The percentile ranks are based on an equating of the Survey of Bas Skills and the Comprehensive Tests of Basic Skills (CTBS), Form Q, which was normed in 1968.

[b] The revised version of the Survey of Basic Skills: Grade 6 was administered in 1975-76, 1976-77, 1977-78, and 1978-79. The percentile ranks are based on an equating of the revised Survey of Bas Skills and the Comprehensive Tests of Basic Skills (CTBS), From S, 1973 edition.



Key:
○ *Comprehensive Tests of Basic Skills* (1968 norms)
☐ *Comprehensive Tests of Basic Skills* (1973 norms)

Fig. 24. National percentile ranks of median California pupil performance, 1969-70 through 1978-79, grade six

Table 34

Estimated National Percentile Ranks of Median California Student Performance 1969-70 through 1978-79 Grade Twelve

Content area	Test administered									
	Iowa Tests of Educational Development Form X, normed in 1962					Survey of Basic Skills[a]	Survey of Basic Skills[a] (Revised)			
	1969-70	1970-71	1971-72	1972-73	1973-74	1974-75	1975-76	1976-77	1977-78	1978-79
Reading										
ITED, 1962 norms	52	49	49	47	47	41	43	42	42	41
TAP, 1970 norms						33	35	33	32	32
STEP, 1970 norms						34	38	36	35	34
Language										
ITED, 1972 norms	42	40	38	36	34	32	34	33	34	34
TAP, 1970 norms						25	27	26	26	27
STEP, 1970 norms						27	29	28	28	28
Mathematics										
ITED, 1962 norms	48	48	48	48	48	41	44	43	43	43
TAP, 1970 norms						38	43	41	41	41
STEP, 1970 norms						41	44	43	43	43

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[a] The new California test, the Survey of Basic Skills: Grade 12, was administered to all California students from 1974-75 through 1978-79. The percentile ranks are based on equating studies of the Survey of Basic Skills and three other tests with national norms: (1) Iowa Tests of Educational Development, Form X-4, normed in 1962; (2) Tests of Academic Progress, normed in 1970; and (3) Sequential Tests of Educational Progress, Series II, normed in 1970.

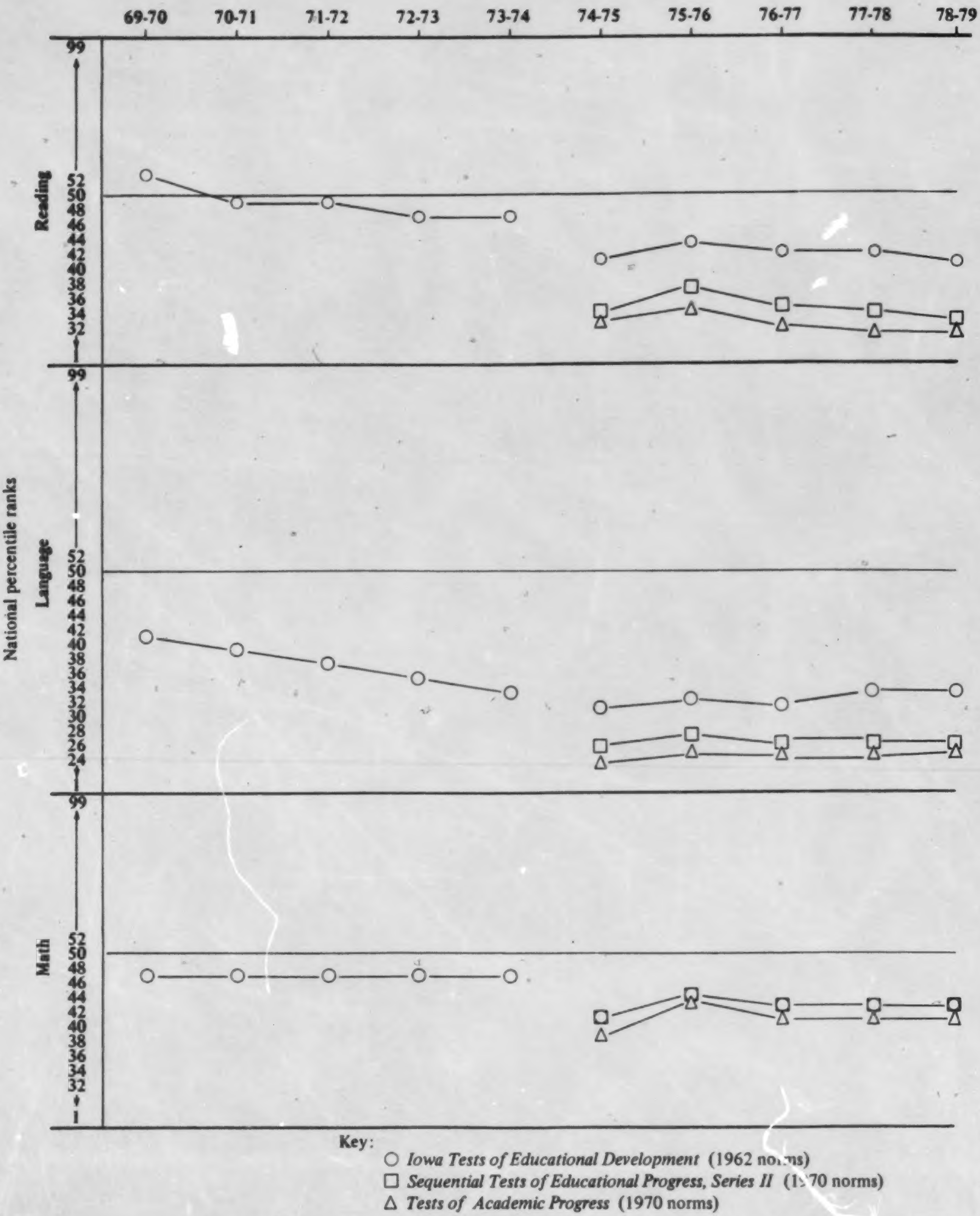
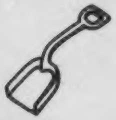


Fig. 25. National percentile ranks of median California pupil performance, 1969-70 through 1978-79, grade twelve

Appendixes

APPENDIX A

Reading Performance, by Skill Area, of California Third-Grade Pupils for 1974-75, 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]					Illustrative test question[2]
			1974-75	1975-76	1976-77	1977-78	1978-79	
TOTAL READING TEST		(250)	(81.3)	(81.4)	(81.7)	(82.2)*	(82.4)*	
I. WORD IDENTIFICATION	(Total and averages for word identification skill areas)	(60)	(85.8)	(85.6)	(85.9)	(86.3)	(86.4)	
A. Sight words	The pupil must choose the word that names the object which is pictured.	5	92.7	92.6	92.9	93.5	93.5	Teacher says: "Mark the word that goes best with the picture."  o see o shovel o shoe
B. Phonetic analysis	(Total and averages for phonetic analysis skill area, a subcategory of word identification)	(45)	(86.1)	(85.9)	(86.2)	(86.5)	(86.6)	
1. Consonants	The pupil must choose the word that has a letter that is not sounded.	15	84.5	83.8	84.2	84.6	84.8	Teacher says: "Mark the word that has a letter that is not sounded." o right o lift o spent
2. Vowels	The pupil must choose the printed word that has the same vowel sound as the oral stimulus word.	20	87.8	88.1	88.2	88.6	88.6	Teacher says: "Mark the word that has the same vowel sound in its middle as the vowel sound in the word run." o cut o ran o fin

[1] The only values presented in this column are averages. The percentages for individual items varied from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

* These values include the fixed score assigned to non-English-speaking pupils, as in past years; excluding those pupils raises the statewide averages to 82.8 for 1977-78 and 83.3 for 1978-79.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]					Illustrative test question[2]
			1974-75	1975-76	1976-77	1977-78	1978-79	
3. Spelling patterns	The pupil must choose the printed word that rhymes with the oral stimulus word.	10	84.9	84.9	85.1	85.0	85.1	Teacher says: "Mark the word that rhymes with the underlined word." show o blow o down o cow
C. Structural analysis	The pupil must identify root words, suffixes, compound words, and contractions.	10	80.9	80.8	81.1	81.8	82.1	Teacher says: "Mark the combination of letters that is the correct division of the underlined word." firehouse o fi + rehouse o fire + house o fireh + ouse
II. VOCABULARY	(Total and averages for vocabulary skill areas)	(60)	(82.6)	(82.9)	(83.4)	(83.9)	(84.1)	
A. Denotation	The pupil must choose the response word that best fills the blank in the sentence.	22	84.0	83.6	84.6	84.9	85.2	Teacher says: "Mark the word that goes in the blank in the sentence." Father told Pat to _____ the back door. o leave o fast o close
B. Relational	(Total and averages for relational skill areas, a subcategory of vocabulary)	(38)	(81.8)	(82.5)	(82.7)	(83.3)	(83.4)	
1. Synonyms	The pupil must choose the response word that means the same as the underlined word in the phrase.	24	83.2	83.5	83.9	84.4	84.5	Teacher says: "Mark the word that means the same as the word that is underlined." a small dog o cute o little o happy o funny
2. Antonyms	The pupil must choose the response word that means the opposite of the printed stimulus word.	10	78.4	80.4	80.1	81.0	81.2	Teacher says: "Mark the word that means the opposite of the underlined word." light o evening o dark o bright

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]					Illustrative test question[2]
			1974-75	1975-76	1976-77	1977-78	1978-79	
3. Homonyms	Although the format of this test item is the same as that used for denotation, the pupil must choose the response word from among three having the same sound.	4	82.4	81.5	81.9	82.3	82.8	Teacher says: "Mark the word that goes in the blank in the sentence." We have _____ dogs. o to o too o two
III. COMPREHENSION	(Total and averages for comprehension skill areas)	(110)	(77.0)	(76.7)	(77.1)	(77.6)	(77.8)	
A. Literal	Given a passage of printed material, the pupil must choose the correct response to a written question that requires identifying or remembering elements in the passage which were explicitly stated.	77	77.9	77.5	78.0	78.5	78.7	Dear Children: I hope that you are having a good time and working hard. I have missed the whole class very much. Miss Smith has been telling me that you have been very helpful to her. Thank you for all your cards and flowers. I have even had a few surprise visits from some of you! I hope to be back as your teacher soon. Until then, your get well cards made me think of you. Your teacher, Mrs. Black What have the children sent Mrs. Black? o cards and telephone calls o cards and flowers o flowers and clothes o food and clothes
B. Interpretive	Given a passage of printed material, the pupil must choose the correct response to a written question that requires using ideas and information, explicitly stated, to paraphrase, infer from, relate, or generalize from elements in the passage.	33	74.9	74.9	75.0	75.5	75.8	Where has Mrs. Black been: o on a trip o teaching in another class o sick o visiting out of town

Skill area	Description of skills assessed	No. of Items	Average percent of questions answered correctly[1]					Illustrative test question[2]
			1974-75	1975-76	1976-77	1977-78	1978-79	
IV. STUDY-LOCATIONAL SKILLS	(Total and averages for study-locational skill areas)	(20)	(88.0)	(88.0)	(88.8)	(89.6)	(90.0)	
A. Alphabetizing	The pupil must choose which letter or word comes first in alphabetical order.	10	87.8	87.3	87.9	88.8	89.5	Teacher says: "Mark the word that comes first in alphabetical (ABC) order." o dent o drive o dart o dog
B. Table of contents	Given a table of contents and a page number, the pupil must choose the story that begins on the given page.	10	88.2	88.8	89.7	90.4	90.6	Teacher says: "A page number is underlined. Look at the table of contents and then mark the title of the story that begins on the page that is underlined." TABLE OF CONTENTS The Happy Puppy .... 6 John's Pet Frog .... 12 The Little Horse .... 19 Moles .... 28 The Lost Turtle .... 32 Page 19 o The Happy Puppy o John's Pet Frog o The Little Horse o Moles

APPENDIX B

Reading Performance, by Skill Area, of California Sixth-Grade Pupils for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL READING TEST		(128)	(66.1)	(65.9)	(66.3)	(66.8)	
I. WORD IDENTIFICATION	The pupil must identify correct pronunciation of words used in context, root words, the meaning of affixes, and contractions.	18	74.3	74.2	74.7	75.2	The ending of the word tallest makes the word mean: o as tall as o less tall o taller than o most tall
II. VOCABULARY	The pupil must identify the meaning of a specific word in context.	25	67.1	66.3	66.9	67.3	The boys made a hasty decision to go camping over the weekend. The word "hasty" as used here means: o hurried o wrong o thoughtful o hard
III. COMPREHENSION		(69)	(64.9)	(64.9)	(65.2)	(65.6)	
A. Literal	The pupil must identify or remember elements which have been explicitly stated. These elements include main ideas, details, and cause-and-effect relationships.	39	67.4	67.2	67.5	67.9	Travelers say our roads would be safer if we changed present road signs to picture symbols, or glymphs. With these picture signs it is not necessary for travelers to learn the language of a country to understand the directions. No words are used on the signs. Those who favor using glymphs in the United States admit that drivers would have to learn the picture symbols first. A glymph is a: o traveler o road o picture o word

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[1] The values presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Interpretive/Critical	The pupil must use ideas and information explicitly stated to infer from, relate, or generalize from elements in the materials read. These elements include main ideas, details, cause-and-effect, and author's purpose.	30	61.8	62.0	62.2	62.6	Glymphs will probably help o prevent accidents o the blind o you learn to read o you learn other language
IV. STUDY-LOCATIONAL	The pupil must identify which reference book to consult and be able to use parts of a book such as an index and table of contents.	16	60.0	59.8	60.5	61.8	If you wanted to know the meaning of the word candid, the best book to use would be: o a dictionary o an encyclopedia o an atlas o the card catalog

APPENDIX C

Reading Performance, by Skill Area, of California Twelfth-Grade Students for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL READING TEST		(141)	(64.1)	(63.6)	(63.3)	(63.2)	
I. VOCABULARY	The student must identify the meaning of a specific word in context; given a definition, the student will select from a list the word most nearly opposite in meaning.	31	61.3	60.9	60.5	60.2	The word "peers" in the last sentence means: o other congressmen o the voters o Speakers of the House o committee chairmen
II. COMPREHENSION		(97)	(64.5)	(63.9)	(63.7)	(63.7)	
A. Literal	From a paragraph or passage, the student must identify or remember elements which have been explicitly stated. These elements include main ideas, details, sequence, and cause-and-effect relationships.	47	69.2	68.9	68.5	68.6	The current reform described in these paragraphs was begun by: o Republican Congressmen o Democratic Congressmen o "Uncle Joe" Cannon o Democratic Senators
B. Interpretive/Critical	From a paragraph or passage, the student must use ideas and information explicitly stated to paraphrase, infer from, relate, or generalize from elements. These elements include main ideas, details, cause-and-effect, and author's purpose.	50	60.1	59.3	59.2	59.0	In the future, committee chairmen will probably o opt for a cleaner system. o have to be more responsible. o be selected by "Uncle Joe." o examine the effects of the earthquake.
III. STUDY-LOCATIONAL	The student must identify which reference book to consult and be able to use parts of a book, such as an index and table of contents.	13	68.4	67.2	67.3	67.4	To discover last year's Gross National Product for the United States, you should consult: o a dictionary o a thesaurus o an almanac o an encyclopedia

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[1] The values presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

APPENDIX D

Written Expression and Spelling Performance, by Skill Area, of California Sixth-Grade Pupils for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL WRITTEN EXPRESSION TEST		(128)	(62.5)	(63.6)	(64.1)	(64.6)	
I. WORD FORMS (See Morphology, Test Content Specifications)	The pupil must select the appropriate suffix (-ed, -ing, -s, -ly, -er, -est, 's) for a word in a given sentence.	16	82.4	82.3	82.9	83.0	Fill in the oval next to the word that best fits each sentence. The children were still _____ in the pool. o play o plays o playing o had played
II. STANDARD USAGE	The pupil must select the verb or pronoun in a sentence which reflects standard English usage.	16	75.3	75.3	75.8	75.9	Fill in the oval next to the word that best fits each sentence. Leroy _____ the movie yesterday. o saw o seen
III. LANGUAGE CHOICES	The pupil must select the most vivid verb or specific noun for a given sentence.	26	54.4	56.5	55.2	55.7	Pretend that you are writing a story. Fill in the oval next to the word that will give your reader the best picture of what's happening. The snake _____ across the grass. o moved o slithered o went

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[1] The values presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
IV. SENTENCE RECOGNITION	The pupil must recognize complete sentences, fragments, run-ons, and normal English word order in sentences.	22	62.3	63.0	63.7	64.4	Fill in the oval next to the group of words which needs more to make it a complete sentence. o They bought a house. o She is hungry. o Pedro is not there. o In the heat of the day.
V. SENTENCE MANIPULATION	The pupil must select the most effective sentence or sentence element.	16	61.7	62.6	63.1	63.8	The following sentences say the same thing differently. Fill in the oval next to the best sentence. o My brother went and broke the new clock. o The new clock was broke by my brother. o The new clock was broken because of my brother. o My brother broke the new clock.
VI. CAPITALIZATION	The pupil must recognize words in a sentence which should be capitalized, such as the beginning word of a sentence, names of persons and places, days of the week, and months of the year.	14	57.4	58.4	59.8	61.0	Fill in the oval next to the line with the mistake in capitalization. If there is no mistake, fill in the fourth oval. o In social studies we are o learning about many countries. o my favorite is Isreal. o (No mistakes)
VII. PUNCTUATION	The pupil must identify errors in the use of the period, question mark, exclamation point, comma, apostrophe, and quotation marks.	18	52.4	52.5	54.4	55.1	Look at the underlined portion to see if there is an error. If you find an error in punctuation, fill in the oval next to the letter of that error. If there is no error, the answer is D. "I dont mean to refuse the doctor's A B advice, but I still believe that sunshine is the best cure for a cold," said Aunt C Olive. No error. D o A o B o C o D

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
VIII. SPELLING		(64)	(63.6)	(63.6)	(64.1)	(64.5)	
A. Relationships	From a list of 3 or 4 words, the pupil must identify the incorrect spelling relationship for vowel and consonant sounds.	35	58.1	58.1	58.6	59.1	Fill in the oval next to the misspelled word in each group. If there is no misspelled word, the answer is "all correct." o stream o screem o sleeve o All correct
B. Word Forming	The pupil must select the correct spelling pattern used in a variety of common word formations.	29	70.2	70.3	70.8	71.0	Pairs of words are given below. In each pair, one word is spelled incorrectly. Fill in the oval next to the correct spelling. o steped o stepped

APPENDIX E

Written Expression and Spelling Performance, by Skill Area of California Twelfth-Grade Students for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL WRITTEN EXPRESSION TEST		(142)	(62.3)	(61.9)	(62.1)	(62.4)	
I. WORD FORMS (See Morphology, Test Content Specifications)	The student must select the appropriate inflectional suffix (-ed, -ing, -s, -ly, -er, -est) for a given sentence, must discriminate between form class words (such as nouns and verbs) and structure words (such as prepositions), and must demonstrate dictionary skills for a variety of purposes.	24	72.6	72.1	72.1	71.9	The dogs had _____ the long trek. o survival o survivors o surviving o survived
II. LANGUAGE CHOICES	The student must identify attitude-conveying words and phrases, must differentiate between specific and general sets of words, and must identify the audience of a prose passage.	32	66.9	66.7	66.6	66.6	Which of the following is most specific? o plant o redwood o tree o living thing
III. SENTENCE RECOGNITION	The student must recognize complete sentences, sentence parts, sentence patterns, and appropriate subject-verb relationships.	20	67.3	67.7	68.4	68.8	Identify the group of words which is incomplete or needs additional words to complete the meaning. o Mack and Sonny skipped school. o The rising clouds of dust. o The day was hot and clear. o Twelve o'clock is lunchtime.

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[1] The value presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
IV. SENTENCE MANIPULATION	The student must select the most economical, effective sentence and must be able to recognize effective coordination and subordination within sentences.	12	42.9	42.9	43.4	43.7	Mark the sentence below which expresses the thought most EFFECTIVELY and ECONOMICALLY. o He spoke to me in a very warm manner when we met each other Tuesday. o When we met Tuesday, I was spoken to in a very warm manner by him. o His manner was very warm when meeting and speaking to me Tuesday. o Tuesday he greeted me warmly.
V. PARAGRAPHS	The student must identify irrelevant material in a paragraph, recognize inconsistent time development, select the logical sequence of a group of sentences, select the sentence which best summarizes the ideas presented in one or more related paragraphs, and identify transitional elements within a paragraph.	26	59.9	59.1	59.3	59.7	Which of the following phrases is used to indicate a connection between the two (given) paragraphs? o Could not know o Even so o They lead o They shape
VI. CAPITALIZATION AND PUNCTUATION	The student must recognize capitalization and/or punctuation errors in sentences.	28	54.6	54.3	54.7	55.4	Identify any capitalization or punctuation errors in the underlined parts of the following sentence. The Hills, who have just returned from A lake Tahoe, are already planning next B winter's trip. No error. C D o A o B o C o D
VII. SPELLING	The student must decide if an underlined word in a given sentence is spelled correctly.	72	68.0	67.9	68.4	68.4	Fill in the oval next to "right" if the word is spelled correctly or next to "wrong" if the word is spelled incorrectly. Carmen steped on my toes. o right o wrong

APPENDIX F

Mathematics Performance, by Skill Area, of California Sixth-Grade Pupils for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL MATHEMATICS TEST		(160)	(57.4)	(57.7)	(58.5)	(59.0)	
I. ARITHMETIC		(96)	(61.0)	(61.0)	(61.8)	(62.3)	
A. Number concepts		(28)	(65.4)	(65.5)	(65.6)	(65.8)	
1. Number and numeration	The pupil must identify whole numbers, fractions, and decimals; identify place value; and recognize points on a number line.	13	75.0	75.6	76.3	77.2	What digit is in the tens' place in 4,263? ○ 2 ○ 3 ○ 4 ○ 6
2. Number theory	The pupil must recognize odd, even, prime, and composite numbers and choose the lowest common multiple or greatest common factor of several numbers.	9	56.1	56.1	56.0	56.4	What is the greatest common divisor of 8, 12, and 16? ○ 4 ○ 8 ○ 12 ○ 16
3. Number properties	The pupil must recognize comutative, associative and distributive properties of operations on numbers.	6	58.6	57.8	56.6	55.4	Name the missing number. $6 \times 15 = \square \times 6$ ○ 9 ○ 15 ○ 90 ○ None of these

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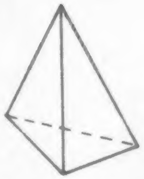
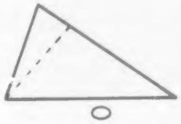
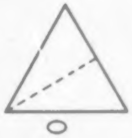
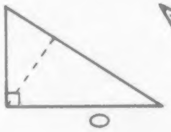
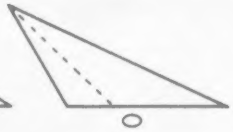
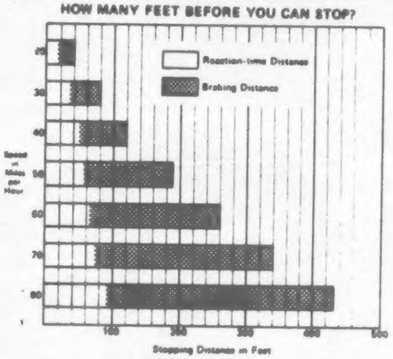
[1] The values presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Whole numbers		(28)	(66.9)	(67.5)	(68.0)	(68.4)	
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving whole numbers.	16	77.4	77.9	78.8	79.4	6003 -209 o 6,794 o 5,894 o 5,804 o 5,794
2. Application	The pupil must apply the four arithmetic operations on whole numbers, solving problems presented in a daily life context.	12	52.9	53.6	53.7	53.6	Joe packs tomatoes 4 to a box. If he has packed 18 tomatoes, which box is he now packing? o the fourth o the fifth o the sixth o the eighteenth
C. Fractions		(20)	(49.6)	(49.0)	(50.6)	(51.3)	
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving fractional numbers.	13	50.5	49.8	52.0	52.9	4 x 4/7 = o 1 2/7 o 2 2/7 o 4 4/7 o 7
2. Application	The pupil must use the four arithmetic operations on fractions and mixed numbers to demonstrate comprehension or ability to solve problems in a daily life context.	7	48.0	47.5	47.9	48.3	Jack's spelling test had 60 words. He spelled 3/4 of the words correctly. How many words did Jack misspell? o 80 o 45 o 15 o 4
D. Decimals		(20)	(56.3)	(57.8)	(59.0)	(59.9)	
1. Computation	The pupil must perform addition, subtraction, multiplication, and division involving decimal numbers.	12	56.6	58.9	60.6	61.6	62.1 - 41.4 = o 10.7 o 20.7 o 21.7 o None of these
2. Application	The pupil must use the four arithmetic operations on numbers in decimal form to demonstrate understanding of principles and ability to solve problems in a daily life context.	8	55.8	56.2	56.7	57.4	The Wards' total expenses during the 8 days at the ranch were $491.60. What was the average cost per day? o $61.45 o $61.32 o $60.20 o None of these

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
II. GEOMETRY		(20)	(58.8)	(58.5)	(59.3)	(59.8)	
A. Knowledge of facts	The pupil must be able to identify basic geometric figures.	8	68.7	68.4	69.7	70.2	 This figure is called a: o pyramid o prism o cylinder o cone
B. Application	The pupil must be able to comprehend and apply basic geometric knowledge and concepts.	12	52.2	51.9	52.3	52.9	Which of the following figures is divided by a line of symetry?    
III. MEASUREMENT AND GRAPHS		(32)	(52.1)	(53.5)	(54.4)	(55.1)	
A. Knowledge of facts	The pupil must be able to estimate length and volume, convert length, mass, volume, and time from one unit to another unit; perform arithmetic operations on quantities of length, mass, volume, and time.	14	44.8	47.2	48.0	48.5	3 yards 1 foot = o 4 feet o 7 feet o 10 feet o 13 feet

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Application	The pupil must be able to solve problems related to measurement of length, area, mass, and volume.	18	57.8	58.4	59.5	60.1	 Use the above graph to find the top safe speed for stopping within a maximum distance of 140 feet. o 30 miles per hour o 40 miles per hour o 50 miles per hour o 120 miles per hour
IV. PROBABILITY AND STATISTICS		(12)	(40.4)	(40.9)	(41.6)	(41.7)	
A. Computation	The pupil must be able to compute probability of simple events and compute the mean, mode, and median of a set of given numbers.	6	42.4	42.3	42.9	43.0	If an event is certain to occur, then the probability of that event is: o 1/2 o 1 o 100 o zero
B. Application	The pupil must be able to solve problems related to elementary concepts in probability and statistics.	6	38.5	39.6	40.2	40.4	A bowl contains one white marble, two red marbles, and three blue marbles. If you were blindfolded and then removed one marble from the bowl, what is the probability that the marble you removed would be red? o zero o 1/3 o 1/2 o 2/3 o None of these

APPENDIX G

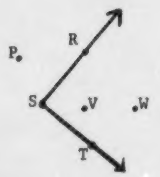
Mathematics Performance by Skill Area, of California Twelfth-Grade Students for 1975-76, 1976-77, 1977-78, and 1978-79

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
TOTAL MATHEMATICS TEST		(198)	(67.0)	(66.3)	(66.3)	(66.5)	
I. ARITHMETIC		(98)	(72.9)	(72.1)	(72.2)	(72.7)	
A. Number concepts		(28)	(74.3)	(73.5)	(73.6)	(73.9)	
1. Number and numeration	The student must identify whole numbers, fractions, and decimals; identify place value; and recognize points on a number line.	14	71.0	70.1	69.9	70.1	In which numeral is the digit 7 in the tens' place? o 976.3 o 97.63 o 9.763 o 0.9763
2. Number theory	The student must recognize odd, even, prime, and composite numbers and choose the lowest common multiple or greatest common factor of several numbers.	8	76.2	75.9	76.4	76.9	If n is an odd number, what can you say about $n + 1$? o It is always odd. o It is always even. o It is even or odd depending upon what n is. o None of these
3. Number properties	The student must recognize commutative, associative, and distributive properties of operations on numbers.	6	79.6	78.5	78.6	78.8	☐ x 7 = (4 x 7) + (5 x 7) What number goes in the ☐ above? o 2 o 8 o 9 o 20

[1] The values presented in this column are averages of the percents of questions answered correctly. The percentages for individual items may vary from the average value by 20 or more points.

[2] These sample test items are presented for illustrative purposes only; therefore, they do not cover all of the skills tested, nor do they necessarily possess all the qualities of good test items.

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Whole numbers		(22)	(80.1)	(80.1)	(80.1)	(80.6)	
1. Computation	The student must perform addition, subtraction, multiplication, and division involving whole numbers.	14	80.9	81.0	81.2	81.9	504 -99 o 405 o 415 o 495 o 505
2. Application	The student must apply the four arithmetic operations on whole numbers in solving problems presented in a daily life context.	8	78.7	78.5	78.2	78.3	A parking lot has 25 rows with 18 spaces for cars in each row. If 3 rows are removed for a driveway, what is the greatest number of cars which can be parked on the lot? o 375 o 396 o 414 o 447 o None of these
C. Fractions		(26)	(66.0)	(64.5)	(64.3)	(64.7)	
1. Computation	The student must perform addition, subtraction, multiplication and division involving fractional numbers.	14	70.4	68.3	68.4	69.0	4 x 4/7 = o 1 2/7 o 2 2/7 o 4 1/7 o 7
2. Application	The student must use the four arithmetic operations on fractions, mixed fractions, or whole numbers and fractions to demonstrate comprehension or ability to solve problems in daily life context.	12	60.9	60.0	59.5	59.6	Jack's spelling test has 60 words. He spelled 3/4 of the words correctly. How many words did Jack misspell? o 80 o 45 o 15 o 4
D. Decimals		(22)	(71.8)	(71.2)	(72.0)	(72.9)	
1. Computation	The student must perform addition, subtraction, multiplication, and division involving decimal numbers.	14	74.1	73.8	74.8	75.9	786.4 - 34.87 = o 4.377 o 43.77 o 751.53 o 7,515.3

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
2. Application	The student must use the four arithmetic operations on numbers in decimal form to demonstrate understanding of principles and ability to solve problems in daily life context.	8	67.8	66.6	67.2	67.7	If Beth can drive 18.7 miles on each gallon of gas, how many miles can she drive on 7 gallons? o 126.9 o 130.9 o 140.9 o 1309 o None of these
II. ALGEBRA		(32)	(62.9)	(62.1)	(61.8)	(62.1)	
A. Computation	The student must be able to perform addition, subtraction, multiplication, and division of algebraic variables and identify a point shown on a rectangular coordinate.	14	66.4	65.9	65.5	66.0	If $7x - 38 = 18$, then $x =$ o -8 o -5 o zero o 5 o 8
B. Application	The student must be able to construct an algebraic equation to solve a given problem and be able to interpret tables, charts, and graphs.	18	60.1	59.2	58.8	59.1	The following formula can often be used to approximate the weight for boys between the ages of 1 to 7: $\underline{W} = 8 + 2{\cdot}2\,\underline{A}$ Where $\underline{W}$ is the weight in kilograms and $\underline{A}$ is the boy's age in years. The formula tells that for each year older that a boy becomes, he should weigh: o 8 kilograms more o 8 kilograms less o 2·2 kilograms more o 2·2 kilograms less
III. GEOMETRY		(24)	(62.7)	(62.1)	(61.8)	(61.8)	
A. Knowledge of facts	The student must be able to identify basic geometric sets and figures.	12	75.2	75.5	75.5	75.4	 Which of the points are in the interior of angle RST? o P only o V only o V and W o R, S, and T

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Application	The student must be able to comprehend and apply basic geometric knowledge and concepts.	12	50.1	48.7	48.1	48.3	In the plane of a circle with radius 5.04 inches, if a point P lies 5.4 inches from the center of the circle, then P lies: o on the circle o at the center of the circle o outside the circle o inside the circle but not at the center
IV. MEASUREMENT		(30)	(60.5)	(59.5)	(59.4)	(59.0)	
A. Knowledge of facts	The student must be able to estimate length and volume; convert length, mass, volume, and time from one unit to another unit; and perform arithmetic operations on quantities of length, mass, volume, and time.	12	71.6	70.5	70.1	69.7	10 decimetres = 1 metre 1000 millimetres = 1 metre The length of a piece of chalk is 0.5 decimetre. What is its length in millimetres? o 0.05 o 5 o 50 o 500
B. Application	The student must be able to solve problems related to measurement of length, area, mass, and volume.	18	53.1	52.2	52.2	51.9	A housewife will pay the lowest price per ounce for rice if she buys it at the store which offers: o 12 ounces for 40 cents o 14 ounces for 45 cents o 1 pound, 12 ounces for 85 cents o 2 pounds for 99 cents
V. PROBABILITY AND STATISTICS		(14)	(57.2)	(56.9)	(57.3)	(57.4)	
A. Computation	The student must be able to compute the probability of simple events and compute the mean, mode, and median of a set of given numbers.	6	57.9	57.6	58.3	59.0	Tom, Dick, and Harry lined up to enter their classroom. What is the probability that Tom was the first one in line? o zero o 1/3 o 2/3 o 1 o None of these

Skill area	Description of skills assessed	No. of items	Average percent of questions answered correctly[1]				Illustrative test question[2]
			1975-76	1976-77	1977-78	1978-79	
B. Application	The student must be able to solve problems related to elementary concepts in probability and statistics.	8	56.6	56.3	56.5	56.2	Three of four boys each weighs 60 pounds. What is the weight of the fourth boy if the average of the weights of all four boys is 70 pounds. o 130 pounds o 100 pounds o 80 pounds o 65 pounds

APPENDIX H

A Description of Equating Procedures Used in the California Assessment Program

Grade Three

School-level frequency distributions of the total reading-score from the Spring, 1977 administration of the Comprehensive Tests of Basic Skills, Form S, Level 1, were obtained from 11 districts: Fountain Valley, Fullerton, Santee, Pomona, Compton, South San Francisco, Redwood City, Salinas City, Ukiah, Berkeley, and Ceres. For each school, the number of students tested on the CTBS and the number tested on the Reading Test, Spring, 1977 administration, were compared. When the difference in the number of pupils tested exceeded 10 percent, the school was eliminated. Nineteen schools were eliminated for that reason. They were replaced by 19 schools wrom San Jose Unified. The total final sample included 138 schools, with 8,699 pupils tested on the CTBS, and 8,589 tested on the Reading Test, after scores of non-English speaking pupils had been eliminated.

The frequency distribution for the 8,699 CTBS scores was totalled. The scores of the 8,589 pupils tested on the Reading Test were used to estimate what the mean and variance of total test scores would have been had all students taken the full 250-item Reading Test. The obtained mean and variance were used to estimate what the distribution of scores would have been had all students taken the total test by assuming that those total test scores would have distributed themselves as a negative hypergeometric distribution.

The two frequency distributions--the actual obtained one for the CTBS, and the estimated one for the Reading Test--were used to develop an equipercentile equating line. This is done by taking any point in one distribution, computing the percent of scores lying below that point in the distribution, and then finding the point in the second distribution that has that same percent of scores lying below it.

The distribution of scores that would have occurred had all pupils in California taken the full 250-item Reading Test, rather than a 25 item sample was estimated for grade three. This was done by first computing the estimated total-test variance from a 2 percent systematic sample of all pupils tested. Again assuming that scores statewide followed a negative hypergeometric distribution, the sample variance and population mean then were used to estimate the statewide distribution of scores.

From the estimated distribution, it was found that if all pupils in the state had taken the full 250-item Reading Test in 1979, the median score for grade three would have been 223.6. From the equating line, this score equated to a CTBS total reading score of 55. A total reading score of 55 on the CTBS at the third grade is equal to the 58th percentile.

Grade Six

Equating for grade six was done in a manner very similar to that for grade three. District-level frequency distributions for the total reading, total language, and total mathematics scores from the Spring, 1977 administration of the Comprehensive Tests of Basic Skills, Form S, Level 2, were obtained from seven districts: South San Francisco, Turlock, Santee, San Jose, Ukiah, Ceres, and Fountain Valley. These seven districts were chosen because they had administered the CTBS to their entire sixth grade population. This was verified against the number tested on the Survey of Basic Skills: Grade 6 (SBS). The total sample included 6,876, 6,830, and 6,845 students on the CTBS in reading, language, and math, respectively, and 6,753 students tested on the SBS.

Equipercentile equating lines were developed for all three areas using the same procedures developed for grade three. The statewide variance was estimated from a one-thirtieth systematic sample of the state. Then, the statewide median was estimated, by content area, for the total SBS by assuming scores followed a negative hypergeometric distribution with the population mean and estimated population variance. The estimated median scores on the SBS were 89.9 (out of 128 items) for reading, 85.8 (out of 128 items) for written expression, and 95.8 (out of 160 items) for mathematics. These equated to CTBS raw scores of 70, 80 and 76 for total reading, total language, and total mathematics, respectively. The corresponding publisher percentile ranks of these scores were 55, 52 and 54.

Grade Twelve

Prior to 1974-75, California Twelfth-grade students had been tested with the Iowa Tests of Educational Development. In January of 1975, the new state-developed test, Survey of Basic Skills: Grade 12, was introduced. In spring, 1975, a special study was conducted to estimate what the statewide performance of California twelfth-grade students would be if they had taken one of the three standardized tests in January, 1975: Iowa Tests of Educational Development (ITED), Sequential Tests of Educational Progress (STEP Series II), and the Tests of Academic Progress (TAP). Using the estimated performance on the publishers' tests and the data from the administration of the new state-developed tests, estimates of California student performances in comparison to national norms were also obtained for 1975-76 and 1976-77.

Estimation of National Norm Comparisons for 1974-75. Data from the following samples of students were used for estimating the performance of the state's median student on selected standardized tests: (1) A 10 percent random sample of 25,000 students drawn from the entire state population of twelfth-graders, with scores on the Survey of Basic Skills: Grade 12, and (2) A stratified random sample of 105 schools with about 30,000 grade-twelve students. All grade-twelve students in each of the schools in the stratified sample were administered one part (content area) of the following standardized tests in the spring of 1975: ITED Reading, Language or Mathematics; STEP Series II, Reading, English Expression, or Mathematics; TAP Reading, Composition, or Mathematics. The data on these students were also available from the January, 1975 statewide administration of the grade-twelve Survey. By matching students within a school on the basis of their birthday and sex, the data from the standardized tests were paired with that of the Survey. Approximately 15,000 students comprised the matched sample.

The procedure for estimating the performance of the median California student as compared to publishers' norms included the following steps.

1. Linear Equating of the Survey Forms. The total number of items in the Survey were spread over 18 forms in a stratified random sampling fashion. Each form had an approximately equal number of items in the three content areas: reading, written expression, and mathematics. Since items were not exactly equal in each form and since the difficulty value of the item cluster within each content area varied from form to form a linear equating procedure was used to convert the raw scores to a common scale scores. For each content area the raw scores on 17 forms were equated to the scale score of the chosen form. The transformation equation took the following form.

$$Y = aX + b$$

$$\text{where, } a = \frac{SD_Y}{SD_X} \quad \text{and} \quad b = \overline{Y} - a\overline{X}.$$

2. Estimation of Median Student Performance. The performance of the state's twelfth-grade median student on each of the nine standardized tests (three tests by three content areas) was estimated by means of a frequency estimation procedure[1]. The purpose of the frequency estimation procedure was to estimate a marginal frequency distribution for each standardized test, given only to a smaller group, using the bivariate distribution of the standardized test with the Survey given to the same small group, and the univariate distribution of the Survey given to a larger group. The marginal frequency distribution of the standardized test gave the estimated distribution that would have resulted if all California twelfth-graders had taken the standardized test. The raw score corresponding to the median of the estimated distribution represented the performance of the median student on the standardized test. The estimated raw score was then converted to the percentile ranking corresponding to the publisher's norm sample. The statewide performance estimates on the three standardized tests in the three content areas--reading, written expression, and mathematics--are given in Table 34.

Estimation of National Norm Comparisons for 1975-76. The student performance in 1975-76 on publisher's test was estimated by assuming that the z-score change from 1974-75 to 1975-76 on the standardized test would be equal to the observed z-score change during the same two years on the Survey. Furthermore, it was assumed that the performance on the typical California twelfth-grade student was represented by the mean statistic both on the standardized test and on the Survey. In particular, the following equation was used to calculate the performance of the twelfth-grade students in 1975-76 on the standardized test in raw score unit:

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[1] For details of frequency estimation procedure, see Bianchini, J.C., "Estimation of California Statewide Performance on Selected Standardized Tests at Grades 6 and 12," ETS, Berkeley, California, 1975.

$$Y' = Y + \frac{SD_Y}{SD_X}(X' - X)$$

where,

Y' = Estimated raw score on the standardized test in 1975-76
Y = Mean raw score on the standardized test in the year 1974-75

X' = Mean Survey score on common items in 1975-76
X = Mean Survey score on common items in 1974-75
SD_Y = Standard deviation of the student scores reported by the publisher
SD_Y = Estimated standard deviation of the student scores on the Survey

The standard deviation of the student scores on the Survey was estimated using the following relationship.

$$\frac{\text{Standard deviation of the district scores on the Survey}}{\text{Standard deviation of the student scores on the Survey}} = \frac{\text{Standard deviation of the district scores on the ITED}}{\text{Standard deviation of the student scores on the ITED}}$$

The standard deviations of the student and district scores on ITED were available from the statewide testing program data for 1973-74. The standard deviation of the district scores on the Survey was calculated from the data available from the 1975-76 administration of the Survey.

The percentile rank corresponding to the estimated mean on the standardized test, Y', was obtained using the test publisher's norm table. The percentile ranks were linearly interpolated from the norm table, if necessary, to find the percentile ranking corresponding to a fractional raw score. Table 34 provides the estimated performance of California twelfth-grade students for 1975-76.

Estimation of National Norm Comparison for 1976-77, 1977-78 and 1978-79. The estimation procedures for 1978-79 were the same as the procedures since 1975-76 except that in the later years' estimations, the values of X and X' were based upon all item data because the tests for the four years were exactly the same. Table 34 provides the estimated performance of California twelfth grade students for 1976-77, 1977-78 and 1978-79.

Appendix I

Use of CAP Information to Improve School Programs

While the primary purposes of the California Assessment Program are to measure student performance in the basic skills and describe this performance to the legislature and school personnel, many other applications of CAP findings have been reported. The great variety of uses reported by state units, school personnel, and the public suggests the need to study further and document such uses. This information, when disseminated to school personnel and others, may encourage the development of other innovative practices and the implementation of more systematic program improvement processes.

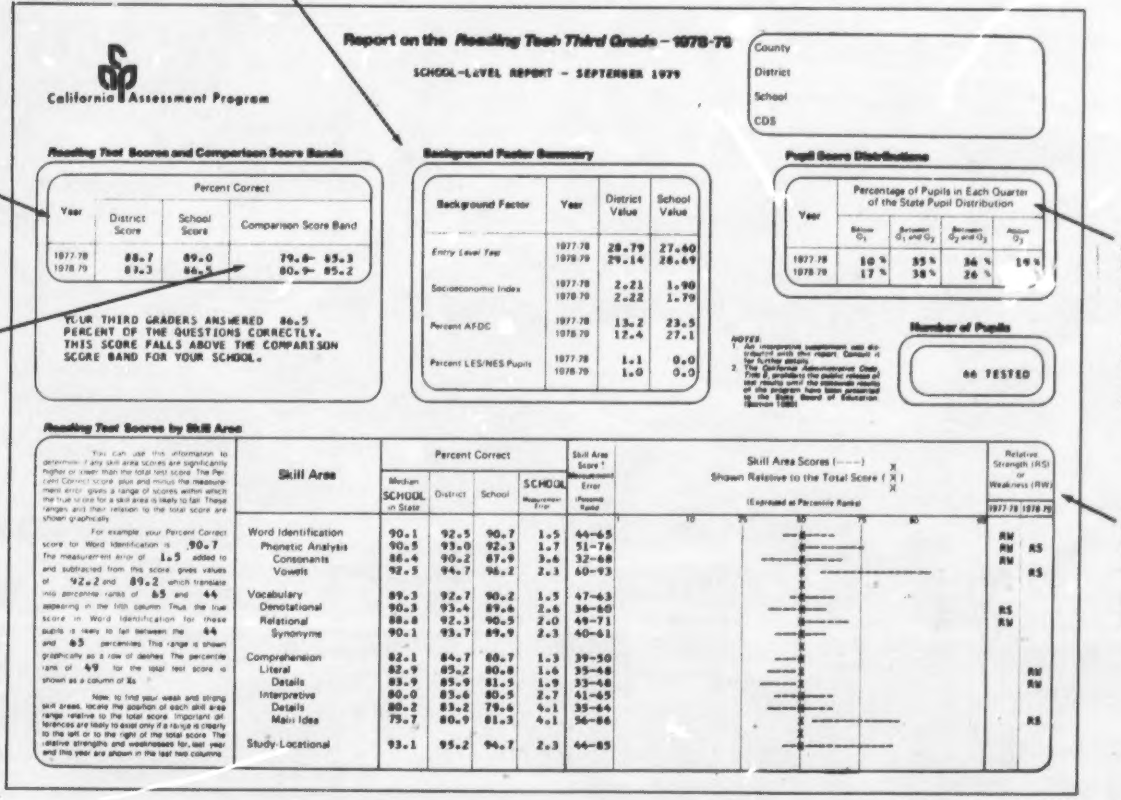
Appendix I contains descriptions of how CAP results are used to help evaluate and improve school programs. In addition, uses by the State Department of Education, the Legislature, other state agencies, and members of the public are also summarized. The Legislature felt that these audiences would find CAP test information useful for a variety of purposes, but primarily for (1) evaluating educational programs; (2) allocating resources in ways what would most effectively remedy program weaknesses; and (3) identifying the characteristics of successful programs and schools. The tables in this appendix show an increasing awareness and use of CAP test information; in turn, this increased awareness suggests the need for a more concentrated effort to document and share school, state, legislative, and public applications of CAP data.

The reader should be aware that CAP test results constitute just one portion of all test information gathered by school personnel and that testing is only one of the assessment techniques used to measure the effectiveness of instructional programs in California schools. The thoughtful interrelating of test information with the other local assessment data leads to balanced judgments and implementation of program improvements.

The remainder of this appendix contains four sections. The first describes the content of CAP reports for districts and schools as described in the first section. The second section contains a summary of local applications of CAP findings, and the third section focuses on uses by state units and the public. The final section contains a list of some of the users of CAP data.

Format of Local Reports

School personnel receive many types of information from the CAP. For example, detailed school- and district level information is supplied to school personnel before this annual report is distributed. Every year test results for each grade level tested--grades three, six, and twelve--are reported back to each school and district along with other information about local schools. Test results are displayed on a computer printout that contains narrative information to assist readers in interpreting scores. Figure 26 shows a sample school report for grade three, and comments about the



California Assessment Program

Report on the *Reading Test: Third Grade* – 1978-79

SCHOOL-LEVEL REPORT – SEPTEMBER 1979

County

District

School

CDS

Reading Test Scores and Comparison Score Bands

Year	Percent Correct		
	District Score	School Score	Comparison Score Band
1977-78	88.7	89.0	79.8- 85.3
1978-79	83.3	86.5	80.9- 85.2

YOUR THIRD GRADERS ANSWERED 86.5 PERCENT OF THE QUESTIONS CORRECTLY. THIS SCORE FALLS ABOVE THE COMPARISON SCORE BAND FOR YOUR SCHOOL.

Background Factor Summary

Background Factor	Year	District Value	School Value
Entry Level Test	1977-78 1978-79	28.79 29.14	27.60 28.69
Socioeconomic Index	1977-78 1978-79	2.21 2.22	1.90 1.79
Percent AFDC	1977-78 1978-79	13.2 12.4	23.5 27.1
Percent LES/NES Pupils	1977-78 1978-79	1.1 1.0	0.0 0.0

Pupil Score Distributions

Year	Percentage of Pupils in Each Quarter of the State Pupil Distribution			
	Below Q_1	Between Q_1 and Q_2	Between Q_2 and Q_3	Above Q_3
1977-78	10 %	35 %	36 %	19 %
1978-79	17 %	38 %	26 %	[illegible]

NOTES

1. An interpretive supplement was distributed with this report. Consult it for further details.
2. The California Administrative Code, Title 5, prohibits the public release of test results until the statewide results of the program have been presented to the State Board of Education (Section [illegible]).

Number of Pupils

66 TESTED

Reading Test Scores by Skill Area

You can use this information to determine if any skill area scores are significantly higher or lower than the total test score. The Percent Correct score plus and minus the measurement error gives a range of scores within which the true score for a skill area is likely to fall. These ranges and their relation to the total score are shown graphically.

For example, your Percent Correct score for Word Identification is 90.7. The measurement error of 1.5 added to and subtracted from this score gives values of 92.2 and 89.2 which translate into percentile ranks of 65 and 44 appearing in the fifth column. Thus the true score in Word Identification for these pupils is likely to fall between the 44 and 65 percentiles. This range is shown graphically as a row of dashes. The percentile rank of 49 for the total test score is shown as a column of Xs.

Now, to find your weak and strong skill areas, locate the position of each skill area range relative to the total score. Important differences are likely to exist only if a range is clearly to the left or to the right of the total score. The relative strengths and weaknesses for last year and this year are shown in the last two columns.

Skill Area	Percent Correct				Skill Area Score ± Measurement Error (Percentile Ranks)	Relative Strength (RS) or Weakness (RW)	
	Median SCHOOL in State	District	School	SCHOOL Measurement Error		1977-78	1978-79
Word Identification	90.1	92.5	90.7	1.5	44-65	RW	
Phonetic Analysis	90.5	93.0	92.3	1.7	51-76	RW	RS
Consonants	86.4	90.2	87.9	3.6	32-68	RW	
Vowels	92.5	94.7	96.2	2.3	60-93		RS
Vocabulary	89.3	92.7	90.2	1.5	47-63		
Denotational	90.3	93.4	89.6	2.6	36-60	RS	
Relational	88.8	92.3	90.5	2.0	49-71	RW	
Synonyms	90.1	93.7	89.9	2.3	40-61		
Comprehension	82.1	84.7	80.7	1.3	39-50		
Literal	82.9	85.2	80.8	1.6	35-48		RW
Details	83.9	85.9	81.5	1.9	33-48		RW
Interpretive	80.0	83.6	80.5	2.7	41-65		
Details	80.2	83.2	79.6	4.1	35-64		
Main Idea	75.7	80.9	81.3	4.1	56-86		RS
Study-Locational	93.1	95.2	94.7	2.3	44-85		

Skill Area Scores (----) Shown Relative to the Total Score (X) (Expressed as Percentile Ranks)

Background factors
(provides descriptors for each grade)

43 percent–very valuable
34 percent–somewhat valuable

Data for two years
(allows comparison with last year's results)

53 percent–very valuable
34 percent–somewhat valuable

Comparison score bands
(shows how similar schools performed)

53 percent–very valuable
31 percent–somewhat valuable

Pupil score distributions
(shows how scores in this school are distributed compared with the scores statewide)

62 percent–very valuable
25 percent–somewhat valuable

Skill area strengths and weakness
(gives in-depth information about subskills)

64 percent–very valuable
20 percent–somewhat valuable

Fig. 26. Sample CAP School-Level Report

purpose of various parts of the report, and partial ratings of the value of these parts by elementary school principals who responded to a CAP survey during the spring of 1979. The reports for grades six and twelve contain the same basic types of information, plus scores for language and math.

Summary of School and District Uses

The following statements serve to provide a sense of the breadth of uses of CAP findings by school and district personnel. This information has been compiled in several ways and from several sources: site visits, questionnaires, regional meetings, telephone surveys, and the daily interactions of school personnel and CAP staff.

- School personnel use the CAP results to study the effectiveness of programs by:

    1. Analyzing longitudinal trends (across years, grade levels, and content areas)
    2. Studying the relative patterns of strengths and weaknesses in specific skill areas
    3. Comparing school or district programs with those of similar schools or districts (use of comparison score bands)
    4. Comparing CAP results with those of other local assessment activities
    5. Comparing CAP findings with national norms and trends
    6. Identifying groups of pupils not making adequate progress
    7. Assessing the relative effectiveness of new programs, recent administrative policies, or organizational changes

- School personnel use CAP findings to develop and improve local programs and to identify and study areas of need. For example, they use the results to:

    1. Examine the curriculum for gaps and areas that may need updating
    2. Target resources toward:
        a. Schools needing financial help or technical assistance
        b. Groups of students with special problems
        c. Grade levels in which students have weaknesses in a content area, such as math, or a skill area (such as decimals) within a content area
    3. Select schools to receive Educational Impact Aid or federal funds

4. Make changes in the amount of instructional time devoted to content or skill areas

- CAP findings provide objective data that support local program improvement activities such as:
  1. The introduction or modification of staff development activities
  2. The development/selection of appropriate instructional materials
  3. The development of specifications for proficiency tests
  4. The documentation of needs for additional assistance from local, state, or federal sources

Table 35 shows the percentage of California's elementary school principals who, in a survey conducted during the spring of 1979, responded to questions about the value of CAP data and the ways CAP findings were used.

Table 35

Uses of CAP Data as Reported by Elementary Principals, Spring 1979

Uses	Percent of Principals
1. Compare results across years	71
2. Revise existing programs	59
3. Examine curriculum more closely	59
4. Develop instructional strategies to correct problem areas	58
5. Call attention to problem areas not previously noted	55
6. Reflect to the community the strengths of the program	51
7. Develop or focus teacher inservice activities	49
8. Compare results across grade levels	45
9. Verify findings from the district's or school's own testing program	38
10. Articulate curriculum and teacher activities within and across grade levels	36
11. Confirm suspicions about a problem area	33
12. Evaluate new programs already implemented	32
13. Document needs for special funds or projects	30
14. Change the amount of time devoted to teaching various skills	27
15. Plan a new program for the school	24
16. Develop new instructional materials	22

Summary of State-Level and Public Uses

The variety of uses and users is at least as great at the state level and among the public as at the local level, as shown below. CAP results are used in:

- Studying statewide trends in regard to:

    1. Overall student achievement statewide
    2. Achievement, by regions, schools, or districts
    3. Statewide performance in content and skill areas
    4. Performance by specific groups of pupils; for example, highly mobile pupils or limited-English-speaking pupils
    5. Performance at different grade levels

- Comparing state and national status and trends
- Evaluating the impact of statewide improvement efforts, (such as school improvement, Miller-Unruh, gifted education, and Migrant education
- Updating state curriculum frameworks
- Developing and supporting statewide efforts to overcome identified weaknesses, such as in written expression
- Identifying schools with high proportions of pupils who need special assistance
- Shifting the emphasis of state support to different grade levels
- Providing objective data for Department of Education review and assistance teams
- Studying the characteristics of unusually successful schools and programs, verifying promising programs and practices that have been identified through other processes
- Allocating state and federal funds to schools whose students have the greatest need or show promise of success
- Studying the consequences of various state and federal funding formulas in terms of overall cost, number of needy pupils, and school impact
- Selecting samples of schools for special studies
- Studying the relative effectivess of schools and districts that use different types of instructional materials, staffing patterns, and approaches to planning and implementation of reform efforts

- Monitoring demographic changes throughout the state and subtle changes triggered by state policies; for example, the number of students retained in a grade or the changes in scores related to an increase in the number of students taking additional courses in English and math

List of Users

The diversity of users who report using CAP findings or data files is illustrated by the following list:

American Institutes of Education
Assembly Office of Research
California Department of Finance
California Department of Health
California School Finance Reform Project
California State Universities
Center for Community Justice
Center for Public Policy, Washington, D.C.
Center for the Study of Evaluation
Children's Research Institute of California
Cities of Berkeley, San Francisco, Los Angeles, San Diego and San Jose
Far West Regional Education Laboratory
Home Savings and Loan
Institute for Research on Educational Finance and Governance
Institute for Responsive Education
Los Angeles County Grand Jury
M-L Policy Group, Chicago
Migrant Education Research Center
National Assessment of Educational Progress
National Education Finance Project
National Institute of Education
Office of the Legislative Analyst
President's Committee on School Finance
Rand Corporation
School Finance Simulation Project
Senate Select Committee on School Finance
Southwest Regional Laboratory of Educational Research
Stanford Center for Research and Development in Teaching
Stanford Evaluation Consortium
SRI International
U.S. Office of Civil Rights
University of California

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